Identifying factors of success and failure in European IST-related national/regional developments:

The case of Flanders

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Executive summary

1. This report examines the case of Flanders, one of the three Belgian regions, trying to explain "how and why" this region has gained some success in adopting the profile of a "Tiger" in the IST area, becoming beneficiary of the so-called Information Society. The aim is to contrast the view obtained for this region, with that of other EU countries and regions, in the framework of the EU-funded "Tigers" project.

2. The analysis is structured in two parts. The first part endeavours to sketch out the general profile of Flanders as well as its characteristics with regard to IST-related regional development: how far can Flanders be qualified as a "Tiger" in the Information Society ? The second section presents a number of factors that explain (or at least, shed some light on the underlying reasons for) the strengths and weaknesses of Flanders as an e-society. The concluding section presents some reflections on the sustainability of current developments for the future of Information Society in Flanders.

3. The general profile of Flanders bodes a region that has many assets to be a "Tiger":

- It is a very wealthy region;
- It is placed in a complex institutional structure in which it owes a large autonomy of powers;
- It shows a high population density and degree of urbanisation;
- It hosts an important manufacturing industry;
- It is remarkably open economy in terms of trade and FDI;
- Figures indicate a very high level of productivity (but salary costs are also remarkably high);
- The population is highly educated, even if there are signs that the education system might not yet have adapted to the new modes of knowledge development in the Information Society.

4. The next question is how far Flanders can be qualified as a "Tiger" in terms of the Information Society, or in what respect this region shows success and failures in the IST area. Available indicators on the various facets of the Information Society in Flanders are collected and assessed, with the difficulty that many useful indicators do not exist at the regional level. As far as possible, these have been put in a comparative settings with the rest of the European Union. Overall, the analysis shows that Flanders reaches at least the average European level for many aspects of the "Digital Society", but also that achievements are not similar according to different facets of this society:

- Flanders is strong in ICT infrastructure developments, with notably a leading position in broadband infrastructure (TV-Cable & ADSL) and, e.g. PC equipment in schools (although this is fairly recent).
- It also hosts a reasonably important ICT sector, with remarkable spin-offs dynamics in some places, and shows relatively high rates of private and public R&D expenses in ICT;
- This strong position is not matched with similar rates of ICT-use, notably the use of Internet by households and (especially small) companies, and also with regard to e-government practices. Flanders is even at the bottom of the European league concerning the rate of consumers buying on-line, showing a lag in the private use of Internet;

- There are signs of a digital divide, as a comparatively large share of the population is not yet accustomed with ICT applications.

5. Thus, potential for the IST developments in Flanders is stronger than effective and diffused usage. Society at large has not realized at full the potential for developments thanks to those IST, which are therefore under-exploited.

6. The report goes on identifying the reasons behind the more and less successful aspects of Information Society in Flanders. It argues that the three critical driving forces, shaping the Information Society in Flanders, are:

- The "Flemish identity push"
- The Telecom market and infrastructure
- ICT-relevant behaviour and attitude.

These three bundles of factors cover a mix of politico-institutional, economic and cultural aspects, as summarised in Table A below.

7. The "Flemish identity push" argument focuses on the politico-institutional dimension. This driving force is linked with the particular situation of Flanders, a region that is pursuing a long-term strategy of autonomy. The process of federalisation of Belgium was at initial time (in the eighties and beginning of the nineties) hampering the development of a strong national vision and policy plans of the IS. But then, supported by a strong political will to build on the Flemish identity, to differentiate from the rest of the country and obtain success based on its own forces, the region focused on high-tech development as a way to reach this ambition. Policy awareness and numerous pro-active programs have been developed, with as flagships IMEC, a world-level excellence centre in micro-electronics, and Telenet, the regional alternative telecom operator. However, the linear vision on which the policy actions were originally founded induced a strong focus on infrastructures and on the "hardware" of the Information Society, rather than a preoccupation for the "software" aspects – mainly the absorptive capacities for such technological developments in the wider public. Progressively, the minds are changing and recent initiatives show a growing attention to users' needs and the recognition of the importance of availability of appropriate applications that could widen the effective usage of ICTs and contribute to regional development in a larger sense. Notably, the Flemish political leaders have also supported the development of a number of agglomerations of firms, specialising in high-tech niches and co-operating both among them and with knowledge institutions. The positive aspects of these ICT-clusters, promoted and supported by the government through increasingly transparent and bottom-up schemes, constitute opportunities for endogenous growth, embedded in the Flanders's innovation system, and based on rather small networks of highly specialised SME's. The achievement of a really "holistic" innovation policy is still a challenge however, as it implies a fundamental change in traditional policy and administrative practices.

Table A The three driving forces behind the Flemish Information Society and their politico-institutional, economic and cultural aspects

3 driving forces	Politico-institutional aspects	Economic aspects	Cultural aspects

1 "Flemish identity push"	Pro-active policy moves in a complex institutional structure. Recent moves to less linear views on Information Society	Promoting knowledge creation in ICT (IMEC), promotion of cluster dynamics impulsing endogenous dynamics	Pro-active promotion of Flemish content in a market with under-critical size: a vicious circle for slow developments?
2 Telecom market and infrastructure	Publicly-led move to make room for Telenet to introduce competition in telecom-market and exploit advantages of the cable density	Dominant position of historical operator, curbing early developments but favouring new ones on the broadband	Responding to the diversity in modes of usage of NICT: the Interactive TV as a solution to the digital divide ?
3 ICT-behaviour and attitudes	e-government initiatives faced with: problems of trust in public institutions, perceived bureaucratic burdens, and complex institutional-structure	Are innovation moods, entrepreneurial environment, education models, and ICT flagships, barriers to develop an ICT-based economy ?	Preferences for the "real" over the "virtual", including real benefits: building a more adapted Information Society model for Flanders ?

8. The shape and dynamics of the telecom market and infrastructure is the second important force behind the development of the Flemish "wired society". A comparative advantage of the region for a long time was the availability of a dense cable TV network over the whole territory. Through the creation of Telenet, a regional telecom operator exploiting this cable network for telephony and data exchanges, Flanders made the plan to introduce competition in the quasi-monopolistic telecom market and exploit new technological opportunities. On the technical side, it is already a success, on the economic and societal aspects, much remains still to be proved. Though competition with the dominant operator did not allow Telenet to offer cheaper access for dial-up connections to the Flemish population, thus maintaining a financial barrier to "first time" Internet access. Today, the proportion of broadband users is remarkable in Flanders, and broadband prices relatively low, but the lack of cheap access to "Internet for beginners" might still be a problem, notably for the poorest and least-aware segments of the population. Even rich populations have their less wealthy citizens, and the digital divide is present in Flanders. A saturation point seems to be reached in terms of attracting new Internet users, well below the rates reached in the Northern EU countries. A new regional strategy is currently implemented to address this issue, with the development of interactive TV. New challenges may appear soon, if satellite or mobile technologies introduce more competition in the market.

9. Behavioural and cultural aspects and Information Society constitute the latter driving force, showing some light on the relative lag in IS progress and for the digital exclusion of a (still too large) number of Flemish SMEs and citizens. One question here is how far the "model" of Information Society proposed is well adapted to the particular habits, preferences and characteristics of the population. The challenge could be to develop a more "Latin" model of

Information Society, with room for the important “real” activities, attention to tangible benefits and profits, combination with social aspects, and the integration of various modes of access and use of information. Another issue is the need, as a pre-requisite for successful exploitation of IST-related opportunities, to foster entrepreneurial spirit and innovative behaviour in companies, and create more links between the advanced companies and the more traditional ones. Finally, the education factor is critical, as IST-developments challenge traditional modes of teaching and learning.

10. The main conclusion from the analysis of these three critical factors is that the bottleneck in Flanders on its way to an Information Society is on the ‘demand-side IST-developments’. From a strength and policy focus on the supply side developments, Flanders has been catching up by addressing demand-side developments at the regional level with a set of initiatives. The balance between the supply-side developments and the demand-side developments improved and already gave rise to a catching up on several IST-related issues. However, much remains to be done if the whole Flemish society is to take benefit from IST-related developments and becomes able to create a customised version of the Information Society, adapted to its own needs and future challenges.

Introduction

The aim of the ESTO "Tigers" study is to explain "how and why" some countries and regions have gained some success in adopting the profile of a "Tiger" in the IST area, becoming beneficiaries of the so-called Information Society. This draft report presents the results of the analysis carried out by MERIT on the case of the Belgian region of Flanders. Reliable statistics on sub-national regions in Europe are still rather scarce and often not very well comparable internationally. More and more, Flanders has come to fulfil a state role, but only very recently statistics, e.g. about Internet, have become available systematically for Flanders. This analysis is based on existing studies and reports and interviews with key informants from the region.

The report is structured in two main sections. The first section endeavours to sketch out the general profile of Flanders as well as its characteristics with regard to IST-related regional development: how far can Flanders be qualified as a "Tiger" in the Information Society ? The second section presents a number of factors that explain (or at least, shed some light on the underlying reasons for) the strengths and weaknesses of Flanders as an e-society. The concluding section presents some reflections on the sustainability of current developments for the future of Information Society in Flanders.

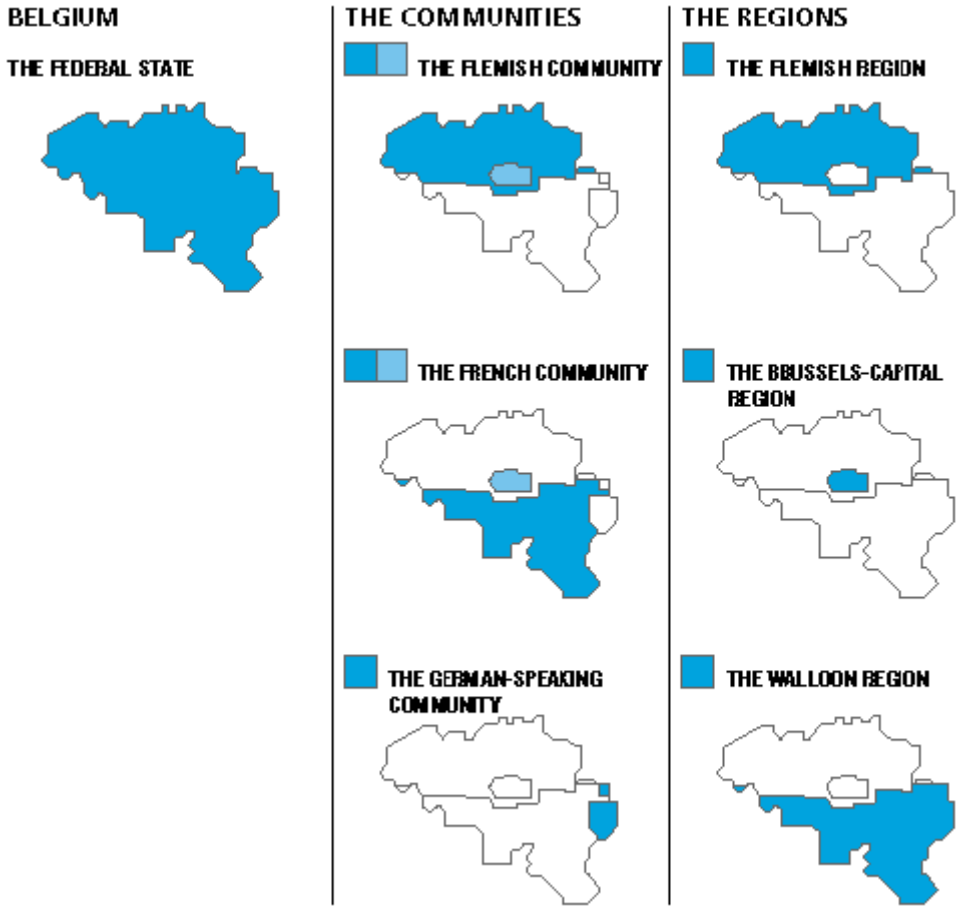
We like to thank all the people who have provided information for this study and those who have commented on earlier drafts of this report.

1 Profile of Flanders in the Information Society

1.1 Flanders, one of three Belgian regions

Since 1993, Belgium is a **federal state** composed of communities and regions. Four legal reforms were implemented in 1970, 1980, 1989, and 1993 to reach this federal structure. Belgium has three official languages (French, Dutch and German), these languages define three communities: French-speaking Community, the Dutch-speaking or Flemish Community and a small German-speaking Community. Belgium has three regions: the Flemish Region (in the north), the Walloon Region (the south) and the small Brussels-Capital Region in the centre (Figure 1.1). Each Community and Region and the federal state have their own government and Parliament.

Figure 1.1 Institutional organisation in Belgium



Source: Federal Office of Scientific Affairs (www.belspo.be)

The **allocation of competences** between those various entities of the Belgian federal state is such that Communities are responsible for "personal" matters (education, health, cultural affairs, etc.) while the Regions are responsible for matters related to the territory (economic development, territory planning, environment protection, etc.). In contrast with the other parts of the country, the Flemish Community and the Region of Flanders have merged into one single entity, with one government and one Parliament. The federal state retains

responsibilities for matters of national interest, such as defence, monetary and fiscal policy, social security system, etc. Most competencies of interest to the development of the Information Society are thus in the hands of the Flemish government, with the notable exception of the regulation of the telecom market, in the hands of the federal state.

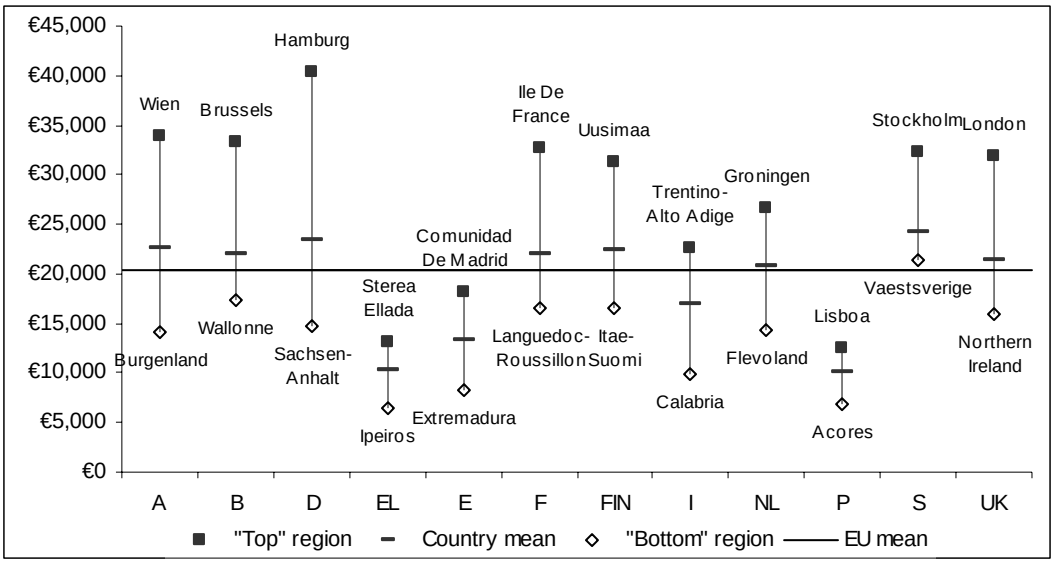
Flanders is the largest region of Belgium in terms of **population**, and **economic activity** (Table 1.1). It is a very densely populated region. Comparing the wealth of regions in Europe, Figure 1.2 shows that the wealthiest regions are mostly the 'state-capital' regions. The Brussels-Capital region has indeed the highest per capita GDP in Belgium.

Table 1.1 General economic data on Flanders as a region of Belgium

	Flanders	*Belgium*	*%*
Inhabitants,1-1-2001	5.952.552	10.263.414	58,0 %
Companies, 2000	414.852	689.453	60,2 %
Un-employed, '01	184.128	502.831	36,6 %
Turnover 2000, bil.EURO	440,7	689,6	63,9 %
GDP, market-prices''00	139,1	246,0	56,5 %
Population density, per sq.km	440	336	
Un-employment rate, 2001	4,3	6,6	
Degree of urbanisation	.	97,4	
GDP/capita, *1000 Euro '99	22,8	23,4	

Source: Ministry of the Flanders Community, 'Vlaanderen 2002 in cijfers'; APS, NIS, World Bank

Figure 1.2 Regional per capita GDP, 1998



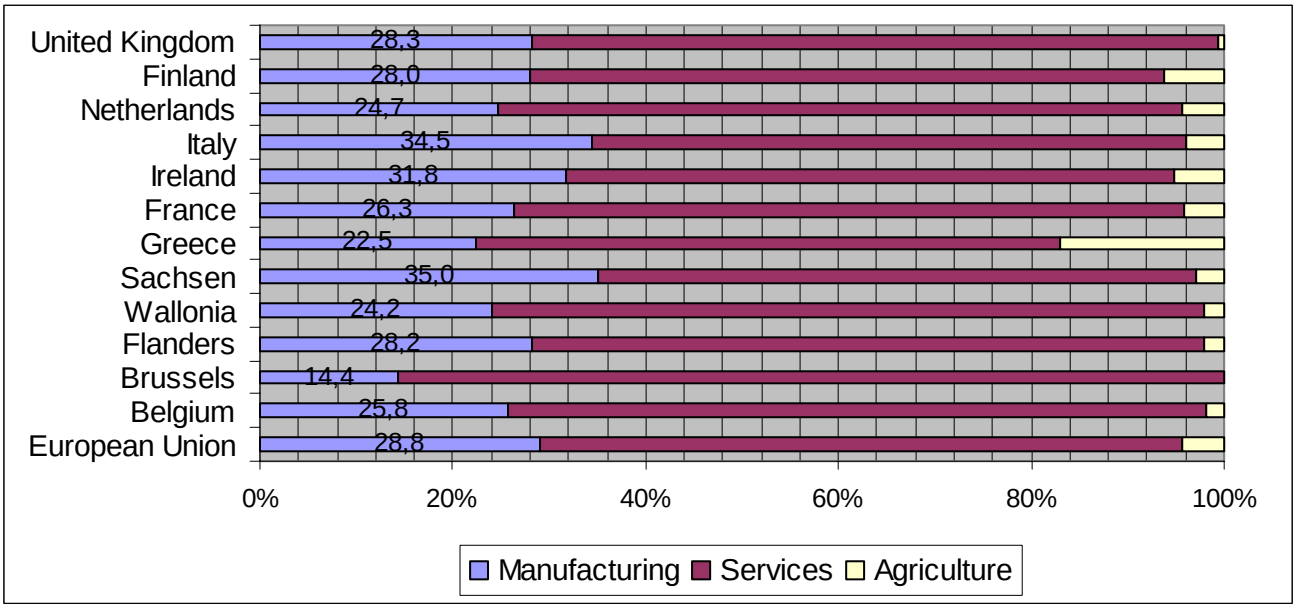
All data at NUTS 2 level, except for B, D and UK at NUTS 1. All data are for 1998, except 1996 for A, I and NL. No regional data for DK, IRL and L.

Source: Eurostat, own calculations.

Today, the **GDP per capita** is higher in Flanders than in Wallonia, notably because Flanders did not have to carry out the immense burden of the closure of heavy industries of the past at

the same level than Wallonia did and still does. Wallonia was the first region to industrialise in Belgium, and even one of the first in Europe. At present the **manufacturing industries** in Flanders form even a higher share in total employment (28,2 %) than it does in Wallonia (24,2 %), see also Figure 1.3. In Flanders the automobile industry, with several large foreign car-plants, is a major contributor to the manufacturing sector. Flanders even produces more cars per capita than Germany or Japan.

Figure 1.3 Economic structure of selection of countries and regions, 2000



Source: Eurostat, 2000.

Table 1.2 Flanders production structure, % of total turnover, 2001

Sector	Nace	% of total turnover
Agriculture	0	1,1
Energy	10	5,7
Mining & Chemical industry	20	8,3
Metal, fine chemical and optical	30	9,2
Other mnf. industries	40	9,7
Construction	50	4,4
Wholesale, trade, repair, hotels etc.	60	43,3
Transport & Communication	70	8,9
Financial services	80	7,8
Other services	90	1,6
Total	100	100,0

Source: NIS

In general however, the automobile sector has become a medium-tech sector. In terms of **innovation**, as measured by the European Community Innovation survey, Flanders does not appear at the top in Europe. Based on indicators like business and public R&D, and patents, Flanders ranks 21 in Europe (see Table 1.3).

Table 1.3 EU regions leading in innovation, 2000 (first ten regions, capital regions, Flanders)

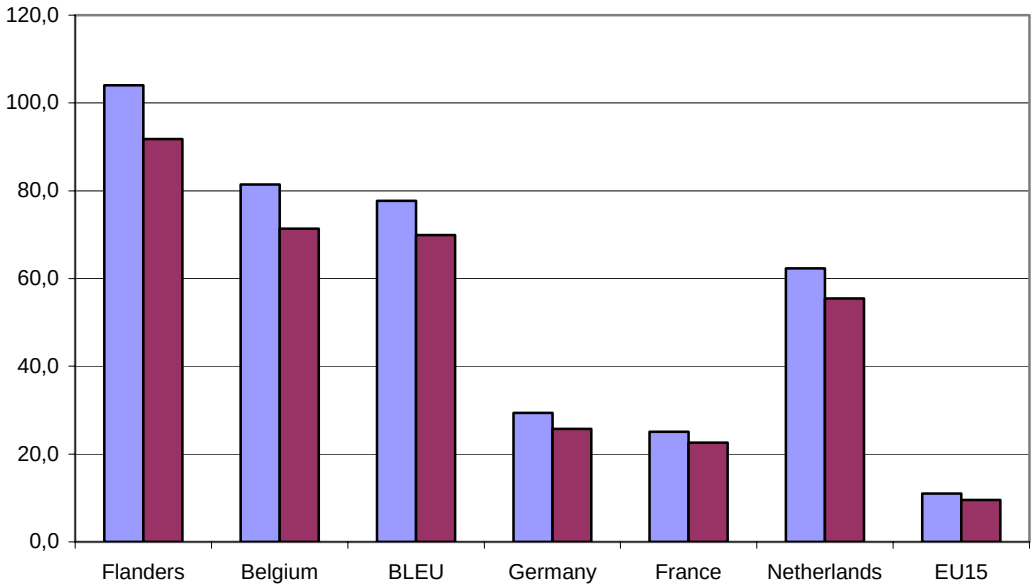
Rank	Region	Country
1	Stockholm	Sweden
2	Uusimaa (Suuralue)	Finland
3	Noord-Brabant	Netherlands
4	Eastern	United Kingdom
5	Pohjois-Suomi	Finland
6	Ile De France	France
7	Bayern	Germany
8	South East	United Kingdom
9	Comunidad De Madrid	Spain
10	Baden-Württemberg	Germany
17	Wien	Austria
21	**Vlaams Gewest**	**Belgium**
22	Lombardia	Italy
31	Southern And Eastern	Ireland
49	Lisboa E Vale Do Tejo	Portugal
50	Attiki Aigaio	Greece

Source: Eurostat 2002, own calculations.

Belgium as a whole, and Flanders in particular, are very open economies, showing extremely high **export** rates (Figure 1.4). Also in terms of **Foreign Direct Investment** (FDI), Flanders shows a remarkably large presence of multinational corporations, in this central part of Europe. The high level of incoming FDI for Belgium (after New-Zealand, the highest level in the world in relation to GDP) is not always seen as a very positive situation, because of the fear of becoming a branch-plant economy, visible e.g. at the time when Renault had closed down their car-plant in Flanders causing huge job losses.

An important economic aspect in relation to ICT is **productivity**. Detailed data for Flanders are not available, so here we have to rely on data for Belgium. Although data on productivity are difficult to compare internationally, Table 1.4 indicates that Belgian productivity performance during the period 1995-1999 was comparable to what was observed for the United States. According to the Federal Planning Bureau (2002) the result hides divergences between services, which overall performed better in Belgium than in the US, and manufacturing, which recorded a slower increase. Indeed, an important economic sector, the Durable Goods Manufacturing, recorded a clearly slower increase in its productivity than in the US. The Federal Planning Bureau (2002) concludes that this divergence partly reflects the better development of ICT producer sector in the US.

Figure 1.4 Degree of openness as a percentage of export in GDP, 1999,2000



Source: APS, 2001

Table 1.4 Comparison of productivity evolution: Belgium - United States - average annual growth rate 1995-1999 (%)

Sectors	Belgium	United States
Agriculture, forestry & fishing	3.7	- 0.7
Mining	2.1	2.5
Construction	2.4	- 0.8
Durable goods manufacturing	3.8	6.5
Non-durable goods manufacturing	4.2	3.3
Transportation & public utilities	3.7	2.4
Wholesale trade	6.3	4.2
Finance, insurance & real estate	2.5	2.9
Other services	0.2	1.2
Total Private Business sector	3.6	2.4

Source: Stiroh (2001) and Federal Planning Bureau (2002)

A next general characteristic is the high level of **education** in Flanders. Flanders scores indeed well on most indicators for the measurement of the level of education of the population. With regard to the quality of education, the PISA project (Program for International Student Assessment), launched by OECD, compared learning performance (reading, mathematics and scientific literacy) of 15-years olds, throughout a large number of countries. In Belgium, the study has been applied separately to the Flemish and French Communities. The results of the enquiry for Flanders are remarkably good: overall, they show that the Flemish youngsters belong to the best students in the world for reading and mathematics literacy, and just below the top level for scientific literacy.

Beyond the overall positive results, two less positive trends can however be noted with regard to the **adaptation of the education system** to the requirement of the Information Society. First, Flanders is one of the regions in which the distance in performance is relatively high between students with high or low economic status; secondly, the scores in reading literacy decrease sharply when the capacities evaluated move from "localisation" capacities (finding an element in a text), to "interpretation" and, more markedly so, "reflection" (providing own vision on the text). Relatively speaking, many students score well in the first type of tasks, but many have more difficulty with the more complex tasks. The latter finding points out that there is still room for improvements in the education system, in the direction of the more analytical and critical capacities that are needed to survive in the "information overload society".

Finally, as a general characterisation of Flanders, we mention the position of Flanders regarding **overall human development**. The Flanders administration for planning and statistics has calculated the position of Flanders on the Human Development Index (HDI), which is based on the level of education, lifetime-expectations, and GDP. Next to Norway, the position of Flanders is number 1 (Table 1.5). This position ought to provide Flanders a 'head-start' in relation to future development towards an information and knowledge-based society.

Table 1.5 Human development index - 2002

	Index Life-expectation	Index education level	Index GDP	Human Development Index (HDI)
Flanders	*0,90*	*0,99*	*0,93*	*0,942*
Norway	0,89	0,98	0,95	0,942
Sweden	0,91	0,99	0,92	0,941
Canada	0,90	0,98	0,94	0,940
Belgium	0,89	0,99	0,94	0,939
Australia	0,90	0,99	0,93	0,939
US	0,87	0,98	0,97	0,939
Iceland	0,90	0,96	0,95	0,936
The Netherlands	0,89	0,99	0,93	0,935
Japan	0,93	0,93	0,93	0,933
Finland	0,88	0,99	0,92	0,930
Switserland	0,90	0,94	0,94	0,928
France	0,89	0,97	0,92	0,928
UK	0,88	0,99	0,91	0,928
Denmark	0,85	0,98	0,94	0,926
Austria	0,89	0,96	0,93	0,926
Luxembourg	0,87	0,90	1,00	0,925
Germany	0,88	0,97	0,92	0,925
Ireland	0,86	0,96	0,95	0,925
New-Zealand	0,88	0,99	0,88	0,917
Italy	0,89	0,94	0,91	0,913

Source: UNDP, APS, 2002

To sum up, the general profile of Flanders depicted above bodes a region that has many assets to be a "Tiger":

- It is a very wealthy region;
- It is placed in a complex institutional structure in which it owes a large autonomy of powers;

- It shows a high population density and degree of urbanisation;
- It hosts an important manufacturing industry;
- It is a remarkably open economy in terms of trade and FDI;
- Figures indicate a very high level of productivity (but salary costs are also remarkably high);
- The population is highly educated, even if there are signs that the education system might not yet have adapted to the new modes of knowledge development in the Information Society.

1.2 Flanders as an Information Society

The next question to be answered is how far Flanders can be qualified as a "Tiger" in terms of the Information Society, or in what respect this region shows success and failures in the IST area.

1.2.1 The ICT sector in Flanders

Flanders is clearly too small to be competitive along a 'complete' ICT-value chain, ranging traditionally from chips, PC-production to software, but it is big enough to develop industrial competitiveness in specific ICT-branches. The ICT sector in Flanders is specialised in telecom equipment (Siemens, Alcatel), consumer electronics (Philips, Barco), IT-system integration & installation (IBM, Telindus), IT-services & software (EDS, Dolmen, Origin, Ubizen), digital photography & printing systems (Agfa-Gevaert, Xeikon), and formerly, speech and translation technology (Lernout & Hauspie Speech Products). According to Larosse et al., 2001 the evolution of the Flemish ICT-sector during the nineties can be divided in two main periods. In the beginning of the nineties, the number of firms was rather stable (see Table 1.6) and employment even decreased (see Table 1.7). From 1994 onwards the number of firms and employment started to grow more quickly. The main players in Flanders are still the same large industrial constructors of the eighties. Most of the young companies are niche players which sometimes clearly benefit from location advantages, local knowledge specializations and network synergies, e.g. these young niche-players often have a link with local strengths in research (e.g. the large regional research centre IMEC) or with mature sectors such as the banking and graphics industry.

Table 1.6 Number of enterprises in Flanders in the ICT-sector in the nineties

Sector	1992	1993	1994	1995	1996	1997	1998	1999
Officemash. mnf.	22	24	15	12	10	10	10	11
Telecom & cons. electronics mnf.	36	32	47	54	59	61	60	55
Wholesale	523	526	543	605	657	726	744	784
Telecom.	5	7	14	23	40	63	81	88
Comp. services	789	796	833	870	942	1 020	1 141	1 279
TOTAL	1 375	1 385	1 452	1 564	1 708	1 880	2 036	2 217

Source: Social Security statistics, several years

For Belgium as a whole the share of ICT in business sector value added did not change much (from 6% to 7% between 1995 and 1999.

Table 1.7 Employment in Flanders ICT-sector over the period 1992-1999

Sector (ISIC)	1992	1994	1996	1998	1999
Office mach. mnf. (30)	511	441	335	341	352
Telecom & cons. electronics mnf. (32)	22 339	19 997	19 868	19 150	19 112
Wholesale (51.64)	6 212	6 191	7 128	9 475	9 879
Telecom. (64.2) (37% Belgacom)	9 809	9 385	9 713	8 267	7 445
Telecom (64.2) (other operators)	261	362	1 002	2 042	2 599
Comp. services (72)	8 136	8 960	11 270	16 250	19 590
TOTAL	47 268	45 336	49 316	55 525	58 977

Source: Social Security statistics (1992-1999)

The ICT production sector in Flanders has contributed considerably to economic growth, but diffusion in terms of ICT investment in other sectors is also an important economic factor. To measure this we again have to rely on national data. From Table 1.8, it appears that the sectors which have invested massively in ICT, are also the sectors which recorded the best performance in terms of productivity evolution.

Table 1.8 Investment in ICT and productivity performance in Belgium (%)

Sector	ICT share in investment 1995	Investment rate 1995	Average annual productivity growth rate 1995-2000
Financial Activities	46.5	10.2	5.1
Machines & Equipment Manufacturing	42.6	13.1	4.5
Electric & Electronic Equipment Manufacturing	37.5	17.7	11.2
Leather & Shoes Industries	33.4	11.5	6.7
Transport & Communications	31.5	30.4	4.5
Trade & Domestic Equipment Reparation	21.7	15.0	6.0
Other Manufacturing Industries	18.2	18.5	4.0
Metal Industry	17.2	13.4	4.5
Textile & Clothing Industries	15.2	16.3	7.6
Chemical Industry	12.0	18.0	6.7
Wood Industry	10.9	19.6	3.6
Food Industry	10.5	19.0	0.5
Transport Material Manufacturing	9.7	12.1	2.4
Public Utilities	8.8	35.2	4.7
Real Estate, Location & Business Services	6.4	33.5	2.4
Construction	6.1	12.0	2.6
Fishing & Aquaculture	5.6	29.0	1.6

Source: ICN (2001) and Federal Planning Bureau (2002)

As it has been identified in other countries, ICT-manufacturing seems to benefit the most in terms of productivity from investing in ICT. The ICT service sector contributed mainly in terms of employment (Table 1.9).

Table 1.9 Belgium productivity and employment, manufacturing and services average annual growth rate 1995-1999(%)

Sector	Productivity	Employment
Manufacturing	4.2	-1.0
ICT producers	6.6	-0.8
ICT users	4.3	-1.7
Non ICT users	3.7	-0.6
Services	1.2	1.0
ICT producers	1.1	4.1
ICT users	1.2	1.1
Non ICT users	1.3	0.2

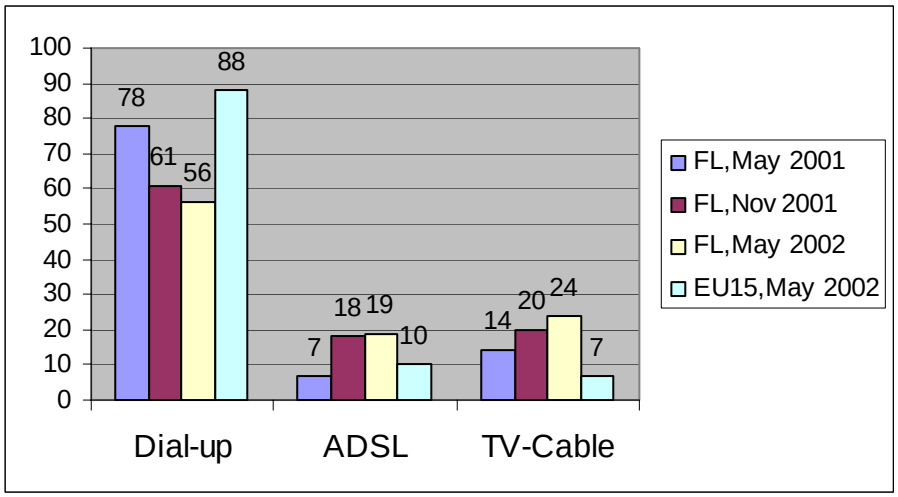
Source: Federal Planning Bureau (2002)

To sum up, it could be said that the Flemish ICT sector, though not remarkably important in the composition of the regions' industries, would certainly not constitute a limiting factor to the development of an Information Society in Flanders.

1.2.2 ICT-Infrastructure

The position of Flanders looks positive on the infrastructure side: broadband penetration is particularly high, especially through TV cable, but also increasingly through ADSL. As those types of connections show a lot of advantages over classical phone connections ("always on", higher speed, higher stability, flat rate prices, etc.), this is a very positive element. The advantage in infrastructure is largely based on the historical situation that almost every household has a TV-cable connection. For a long time this infrastructure has been a promising asset for IST development, although it is only recently paying off, in terms of an internationally high and rising popularity of a broadband internet connection trough cable (Figure 1.5). This makes it possible to study the development of digital television as a new channel for accessing the Web.

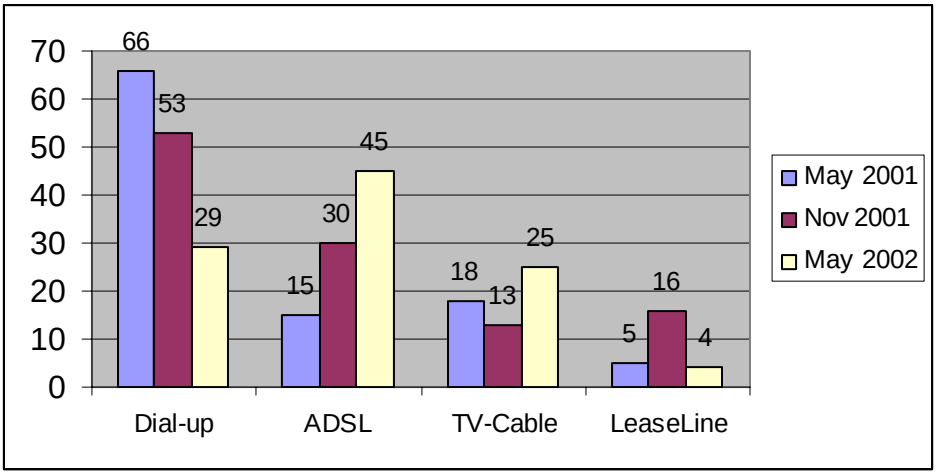
Figure 1.5 Main types of Internet connection in Flemish households, percentage of connections, 2001-2002



Source: Internet Statistieken Vlaanderen, May '01 - May '02 and Flash Eurobarometer 125, 2002. Note: For EU-15 multiple answers possible.

The rise in broadband connections is even more pronounced in companies than in households (Figure 1.6). Almost half the companies connected to Internet in May 2002, do this through an ADSL broadband connection. Most importantly, the dial-up connection mode is on a sharp decrease (see also section 2.2). For leased lines a sharp decrease was identified bringing it back to the level of the first measurement. Thus, the region experiences an overall shift from slow to fast internet.

Figure 1.6 Type of Internet connection in Flemish companies, percentage of those having connection, more than one type possible, 2001-2002

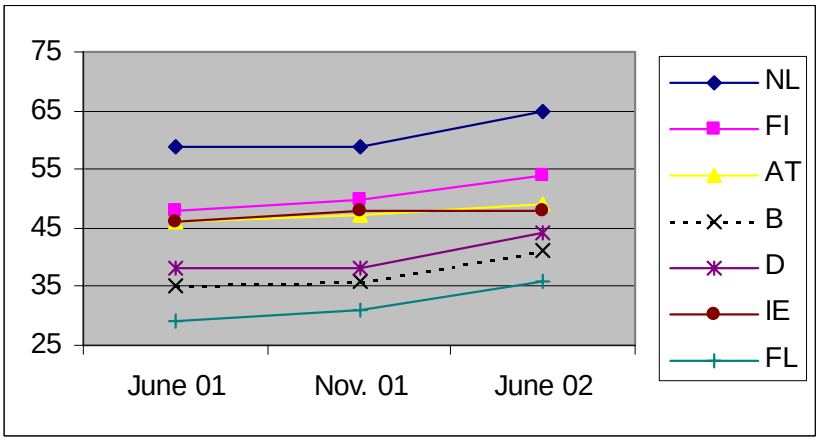


Source: Internet Statistieken Vlaanderen, May '01 - May '02

1.2.3 Citizens and the Information Society

Total penetration of Internet in households in Flanders is much lower compared to most European countries (Figure 1.7). Moreover, the trend over the last two years did not show a clear sign of catching-up, although the penetration rate has increased.

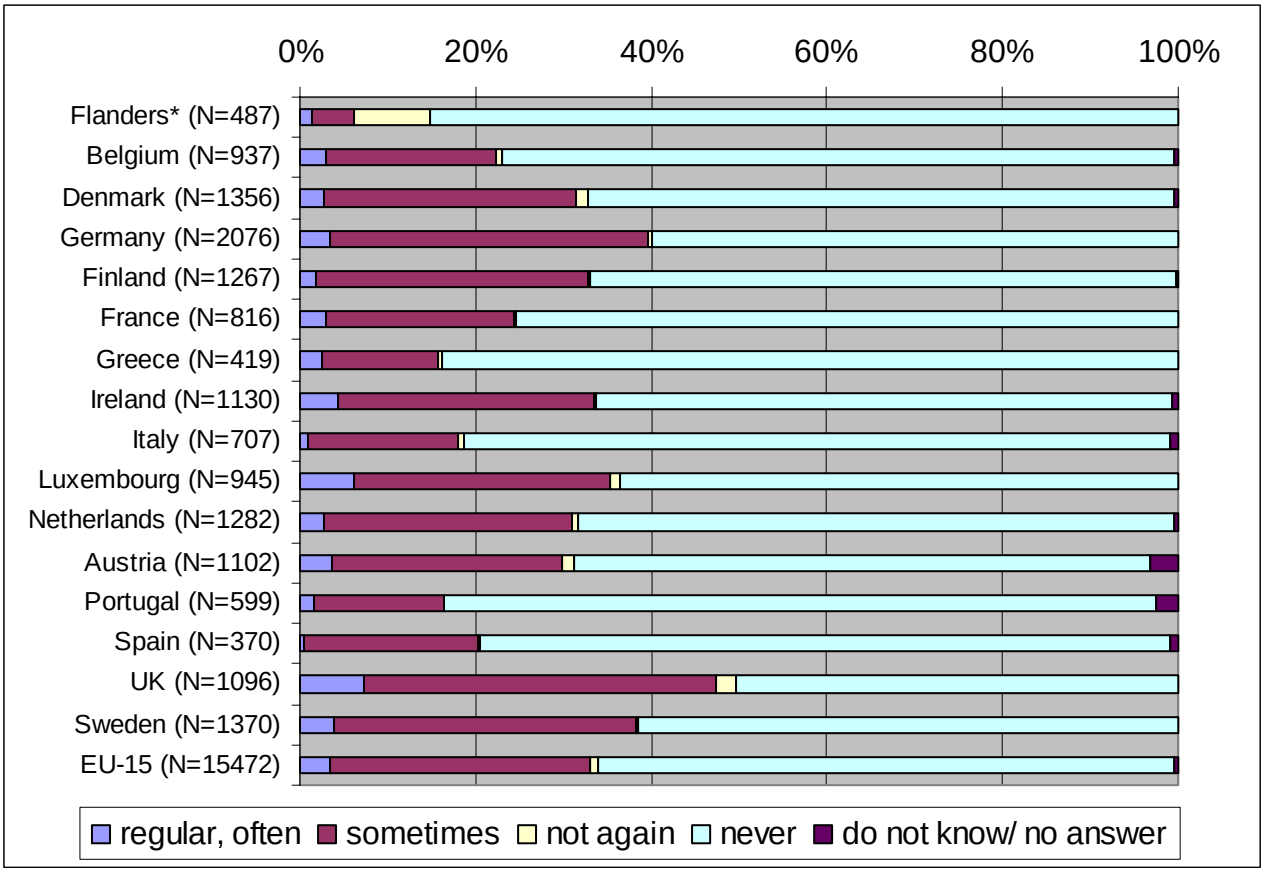
Figure 1.7 Internet penetration households, %, 2001-2002



Note: The survey for Flanders was in May 2001 and May 2002. Source: Flash Eurobarometer 125 and Internetstatistieken Vlaanderen, 3e meting

Besides access to Internet at home, the use of Internet for buying on-line by Flemish citizens is also strikingly low (Table 1.10). In 2001 more than 80% of the internet users never use it for buying on-line. Flemish citizens are not only weak users of Internet for buying-on-line, but count also the largest proportion of citizens in the EU, that have once tried to buy online but do not wish to do so in the future.

Table 1.10 Purchase frequency via Internet, percentage of Internet users in Flanders and EU Countries, 2001



Source: EOS Gallup Europe, MVG afdeling Media, 2001

According to data from a regional enquiry[1], the digital divide, by age, level and education (and less so by gender) is a reality in Flanders: the percentage of PC and Internet use in the categories of older and less-educated citizens, lies far below the overall figures for the total Flemish population (Tables 1.11 and 1.12). Other data on activities performed with PCs and Internet show that the rate of connection goes along with the intensity and diversity of use of ICT. To the question why they do not have a PC or Internet connection at home, most respondents state that they do not need them, or, as a second reason, that they are not able to cope with them. Differences in responses to this question are mostly linked to age and level of education, but not so much by gender, to the point that the analysts of the enquiry results state that "*this difference* (between mens' and womens' use of PC and Internet) *will probably completely disappear in a few years*" (VRIND[2], p.372).

[1] APS-survey, cited above.
[2] Vlaamse Regionale Indicatoren, 2001, Vlaamse Gemeenschap.

Table 1.11 Rate of PC and Internet use in Flanders, according to gender and age (2001)

	Total	Men	Women	18-24	25-34	35-44	45-54	55-64	65-74	75-85
Use of PC (% of population)	47.8	54.4	41.0	78.4	70.5	65.3	52.0	23.9	7.5	3.8
Use of Internet (% of population)	34.3	40.6	28.0	68.1	54.2	44	36.5	11.7	3.2	0

Source: VRIND (2001)

Table 1.12 Rate of PC and Internet use in Flanders, according to level of education (2001)

	Total	No or primary	Lower Secondary	Higher Secondary	Tertiary (non-univ.)	University
Use of PC (% of population)	47.8	8.7	36.9	61.7	83.9	86.7
Use of Internet (% of population)	34.3	4.5	26.8	42.7	62.8	72.3

Source: VRIND (2001)

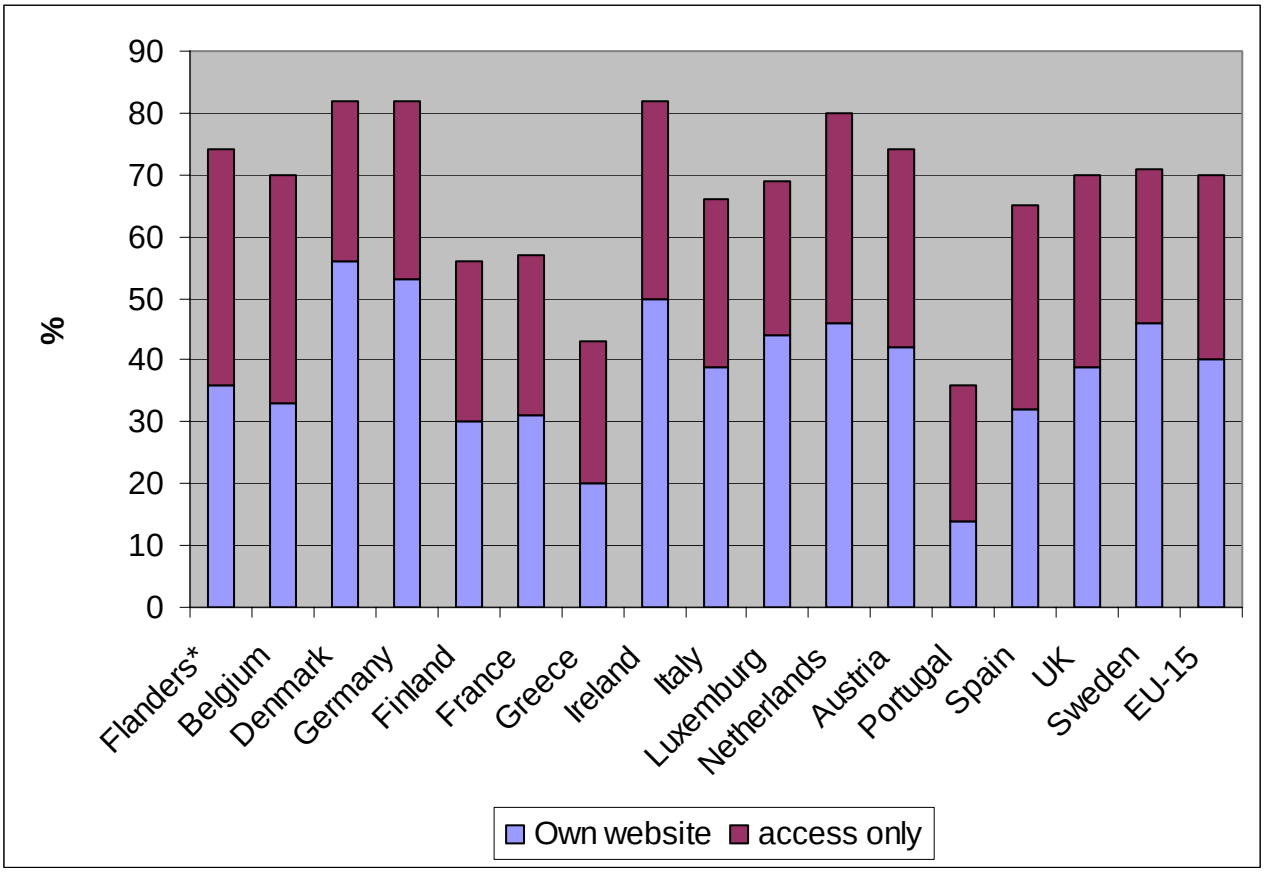
1.2.4 SMEs and the Information Society

A number of indicators show that SMEs in Flanders, as compared to SMEs elsewhere in Europe, achieve average results with regard to their integration into the Information Society:

- The proportion of companies with Internet access lies just above EU average (Figure 1.8);
- The proportion of SMEs with own Internet website is below European average: 36% as compared to 40% (Figure 1.8);
- The proportion of companies[3] with an Intranet connection is well below EU average: 20.4% as compared to 56.7% for the EU average (ICT-Monitor, 2001);
- Belgian firms are lagging behind in e-commerce practice: only 12% use Internet for procurement (as compared to 42% in the EU in average), and 19% for sales (as compared to 49% in the EU) (De Vil et alii, 2002). A relatively passive use of Internet by Flemish firms is evidenced in Figure 1.9, showing also the tiny share of firms active in e-commerce in the region. An enquiry conducted by Cisco Belgium in 1999 delivered the same message: 40% of companies had not interest whatsoever in e-business at the time of the enquiry (Aelbrecht, 2001).

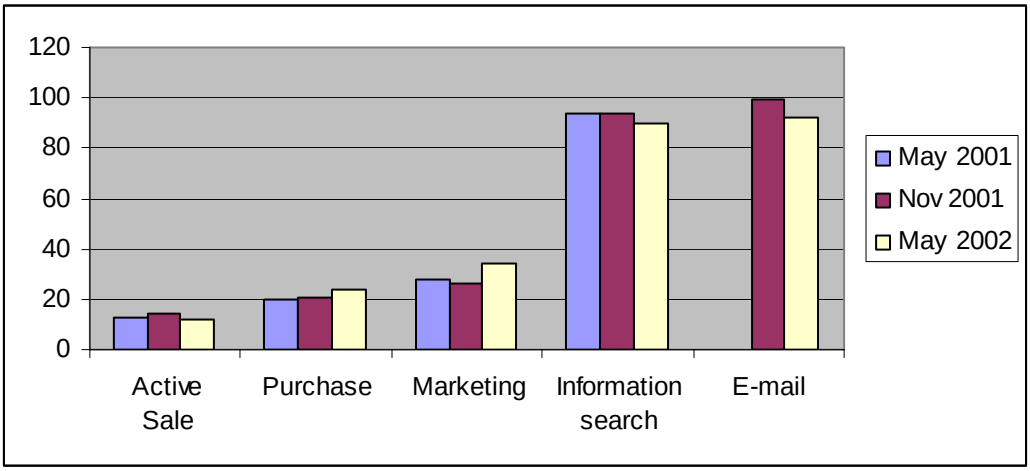
[3] Those figures refer to all companies, rather than SMEs.

Figure 1.8 Internet at SME's in Flanders and European countries, % own web-site and % access only, spring 2000[4]



Source: Eurobarometer, MVG afdeling Media

Figure 1.9 E-commerce activity for Flemish firms, 2001-2002



Source: Internetstatistieken Vlaanderen, 3e meting (2002)

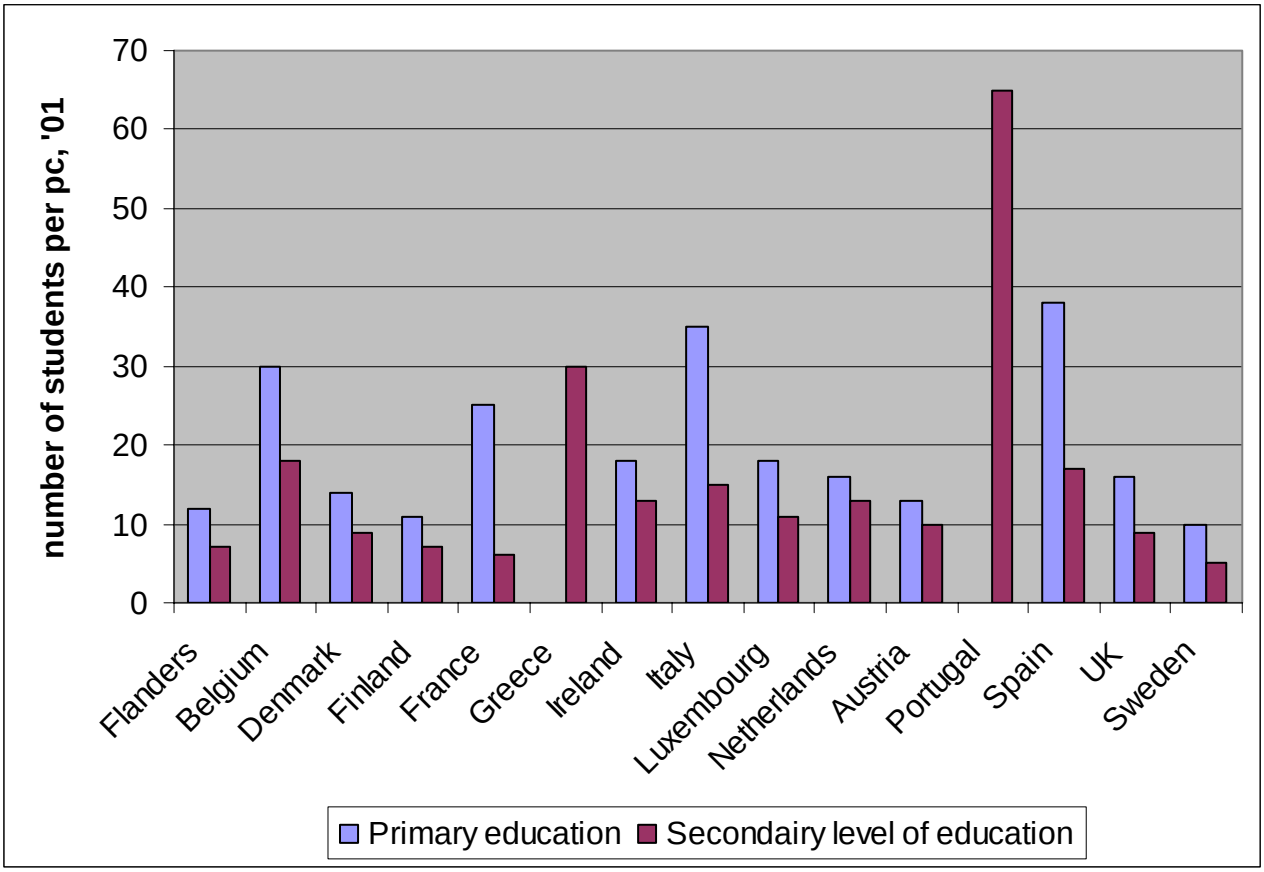
[4] Size limits for SMEs in the Flemish enquiry is 200 employees, while for the EU it is 250 employees.

Those figures show that Flemish SMEs have undertaken some catching-up with regard to the access to Internet, but not really in terms of developing an active use of its possibilities.

1.2.5 Schools and the Information Society

Flanders belongs today to the European leaders in terms of school connections to Internet and number of students per computer (see Figure 1.10; note that a low number shows a good performance) and performs much better than other Belgian regions on those two aspects. This current situation shows a strong and recent catching – up, to be linked to voluntary policies (especially the PC/KD project) put in place by the government in Flanders (see section 2.1).

Figure 1.10. Number of pupils per PC at schools in Flanders and EU countries, 2001



Source: Commission of the European Communities, Digikids, 2001

1.2.6 E-government

Regional data on e-government practices are scarce. Studies on this aspect usually focus on the national level (see Table 1.13). A recent European Commission study (European Commission and Cap Gemini Ernst&Young, 2002) analysed the degree of online sophistication for 20 public services. The enquiry reveals that the position of Belgium is systematically low on the availability of online public services, and particularly in the areas of:

- Income taxes (17th rank in a panel of 18 countries);
- Social security benefits (16th rank);
- Police declaration (17th rank);
- Enrolment in higher education (17th rank);
- Corporate tax (16th rank);

- VAT (13th rank);
- Customs declarations (14th rank);
- Public procurement (12th rank).

In only one area, environment-related permits, does the country belong to the best-rated countries.

Table 1.13 Ranking e-government achievements

Rank	Country	Score
1	USA	2,8
2	Singapore	2,4
3	Australia	2,2
4	Canada	2,0
5	France	1,6
6	UK	1,4
7	Hong Kong	1,3
8	New-Zealand	1,3
9	Norway	1,2
10	Spain	1,2
11	Germany	1,1
12	The Netherlands	1,0
13	South Africa	0,9
14	Italy	0,9
15	Japan	0,8
16	Ireland	0,6
17	Mexico	0,6
18	**Belgium**	**0,5**
19	Malasia	0,4
20	Brasil	0,2

Source: Accenture, 2001

At the municipal level, the situation is quite worrying too, according to a study carried out on 55 cities and municipalities throughout Belgium, by the research bureau AGConsult (Financieel Economishe Tijd, 8 November 2002). The main conclusions of the enquiry was that the websites of the municipalities were not sufficiently user-friendly: 85 % of them do not respond to the basic criteria to define this user-friendliness, and they were in general much lower scored that the average Belgian websites from other origins (out of which "only" 60% have failed the test). The main criticisms are that the information offered is very limited or difficult to find, even for basic information such as addresses and opening hours, and not organized to respond to citizens' needs and expectations.

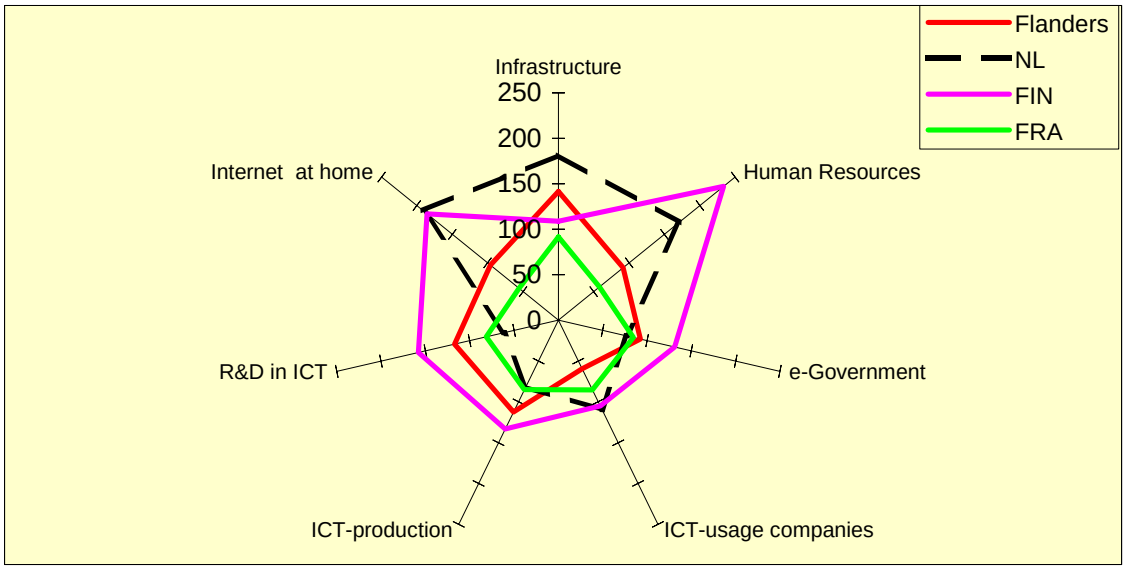
It is difficult to extrapolate the results obtained at national level to the regional level, as areas of competences, organization modes, resources, strategies, etc. differ a lot between federal- and regional-level administrations. Many initiatives have been taken by the Flemish government in recent years, in order to develop the scope and depth of e-government, but data to measure achievements are lacking. A positive indication is however given by e-Europe data which shows that the number of Flemish Internet users that have used the net for accessing government information in 2001 is higher, with 51%, than EU average (44.9%).

1.2.7 Summary of benchmarking exercises for Flanders as an Information Society

According to the Flemish "ICT Monitor" released mid – 2002, compared to the situation in Europe as a whole (EU15=100), Flanders is best placed on the infrastructure dimension, but

ICT use in companies and households is comparatively lagging behind. The other dimensions of the Information Society in Flanders do not differ significantly from the average in Europe, though they are generally slightly above average (Figure 1.11 and Table 1.14).

Figure 1.11 Benchmarking e-Flanders along 7 key dimensions



Source: ICT-Monitor Vlaanderen, 2002.

Table 1.14 Benchmarking e-Flanders along 7 key dimensions

IST indicators	Flanders	Bel.	EU+	NL	Fin.	Fra.
Infrastucture						
Internet-penetration companies, in %, 2001	**58**	49	63	65	95	69
Number of broadbandconnections per 1000 households, '00	**86**	103	45	117	30	33
Human resources						
No. of students sec. education per on-line computer '99/'00	**18**	14	15	15	8	22
Teleworking employees, %, 2001	**6**	6	6	14.5	16.8	2.9
e-Government						
% Internet-users use internet for Government-info, 2001.	**51**	50	45	47.5	42.6	49.3
% local communities with public website, '00	**40**	38	56	27	94	33
ICT-usage in companies						
% of firms with intra-net, 2001	**20.4**	…	56.7	61.0	59.0	50.0
SME's with internet (index: large firms = 100) 2001	**59.4**	72.0	71.7	80.0	76.0	59.0
ICT-production						
% share of value-added of ICT sector in GDP, '00	**7**	5.8	6.2	5.1	8.3	5.3
R&D in ICT						
R&D expenditure ICT sector, % of private R&D exp, '97	**37.8**	20.1	32.3	19.6	51.0	26.2
Internet at home						
Internet-penetration households, in %, May/June 2001	**29**	27.3	30.2	57.7	56.1	16.8

	Flanders	Bel.	EU+	NL	Fin.	Fra.
Infrastructure	**142**	153	100	182	109	91
Human Resources	**92**	104	100	171	234	58
*e*Government	**93**	89	100	77	131	84

ICT usage companies	**59**	100	100	110	105	85
ICT production	**112**	93	100	82	133	85
ICT Research and Development	**117**	62	100	61	158	81
Internet at home	**96**	90	100	191	186	56

Source: ICT-Monitor Vlaanderen, 2002.

Based on the above benchmarking exercise, we can estimate the position of Flanders on the ISI and IMD indexes[5], based on the identified 'distance' of Flanders to the scores of Finland on comparable indicators (see Table 1.15). The ranking of the countries are consistent across the three exercises. This brings us to an estimated ranking of Flanders between Canada and Japan on place 12 (see Table 1.16).

Table 1.15 Flanders in 3 Benchmarking exercises (estimates based on ICT-Monitor 2001)

BM exercices	Flanders	BEL	NL	FIN	FRA
ICT-monitor	87	81	89	100	60
IMD* (2001)	n.a.	70	89	100	63
ISI** (1999)	87 (est)	75	88	100	69

*Source: Wintjes, Dunnewijk & Hollanders, 2001; * World Competitiveness Report (IMD, 2001), http://www.weforum.org; ** Information Society Index.*

Table 1.16 Benchmarking e-Flanders with 16 countries

Rank	Country	Score
1	Sweden	6,496
2	Norway	6,112
3	Finland	5,953
4	United States	5,850
5	Denmark	5,837
6	United Kingdom	5,662
7	Switzerland	5,528
8	Australia	5,382
9	Singapore	5,269
10	Netherlands	5,238
11	Japan	5,182
	Flanders	
12	Canada	5,126
14	Germany	4,937
15	Austria	4,868
16	Hong Kong	4,745

Source: Wintjes, Dunnewijk & Hollanders, 2001

The above findings were confirmed in an analysis of the ICT base in Flanders (PricewaterhouseCoopers, 2001), based on interviews. The infrastructure, ICT R&D and spin-offs dynamics are best rated. The "liberalisation of the telecom market" and "telecom costs" items came out as more problematic dimensions for Flanders, after the well-known argument

[5] Information Scociety Index; World Competitiveness Report (IMD, 2001), http://www.weforum.org.

of high overall salary costs, and together with the problem of shortage of ICT specialists in the market (Table 1.17).

Table 1.17 Rating of key indicators for the development of an ICT base in Flanders (2001)

Key indicators	Score, development
Firms environment	
Dynamics of ICT cluster	7 +
ICT office infrastructure	7 +
Availability of venture capital	8 =
Government	
Liberalisation of telecom market	5 +
Stimulation of R&D and innovation	8 =
Image of Flanders as an ICT location	6 =
Telecommunication infrastructure	8 +
Knowledge institutions	
ICT education	7 =
ICT R&D	7 +
Spin-offs/incubators	7 +
Population	
ICT specialists in labour force	5 +
ICT penetration and use	6 +
Regional costs structure	
Salary costs	4 =
Telecom costs	5 +
Real estate costs	8 -
Company tax	6 =

Source: PricewaterhouseCoopers, 2001

Note: Rate of 8 means that the development is sufficient to place the region favourably in Europe, rates lower than 8 indicate shortcomings that need to be overcome. The sign after the rate means: + positive evolution, = stable, -: negative evolution

1.2.8 Conclusion

Overall, the various elements analysed in this first part of the report deliver a contrasted view on Flanders' position as an Information Society. The region is very wealthy and possesses all the necessary pre-conditions for a development based on the exploitation of ICTs: it is a centrally-located and urbanised region, with high quality human capital, an open and well-performing economy. Turning to ICT-linked dimensions, analyses show that Flanders reaches at least the average European level for many aspects of the "Digital Society", but also that achievements are not similar according to different facets of this society:

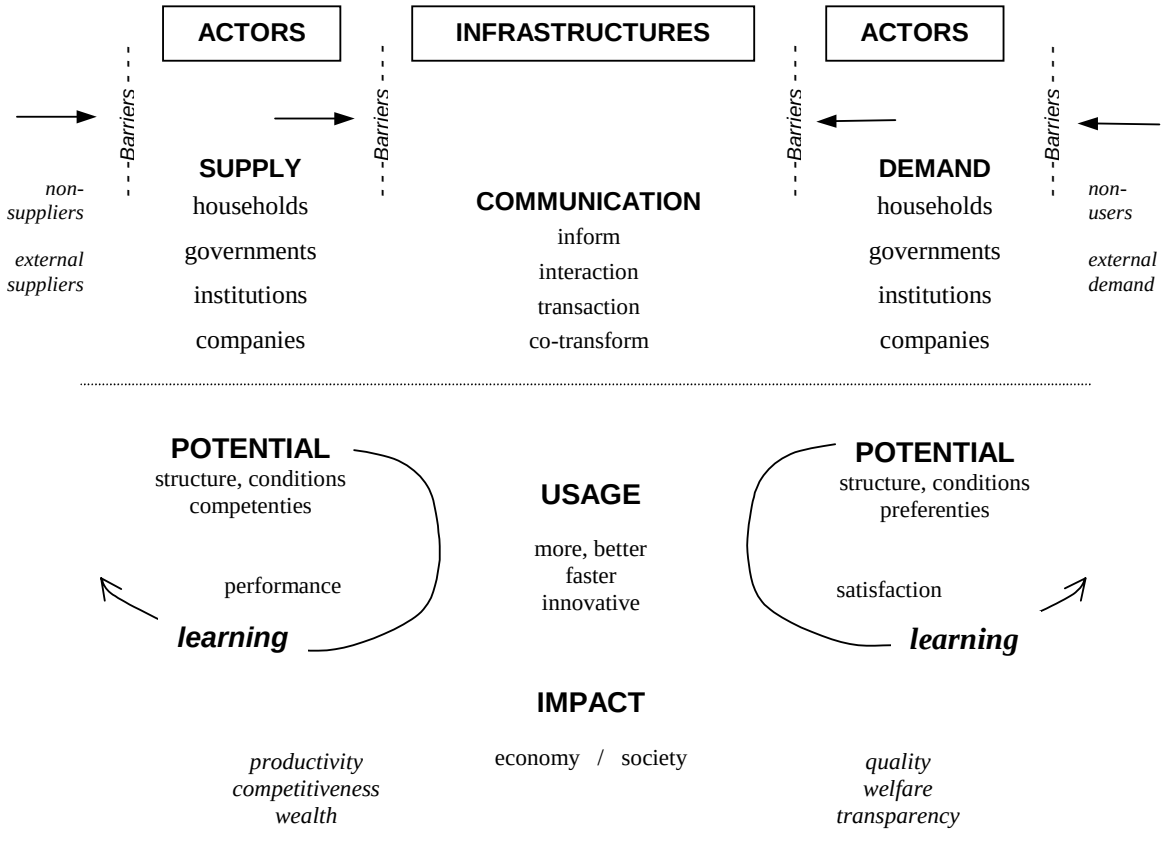
- Flanders is strong in ICT infrastructure developments, with notably a leading position in broadband infrastructure (TV-Cable & ADSL) and, e.g. PC equipment in schools (although this is fairly recent).
- It also hosts a reasonably important ICT sector, with remarkable spin-offs dynamics in some places, and shows relatively high rates of private and public R&D expenses in ICT;

- This strong position is not matched with similar rates of ICT-use, notably the use of internet by households and (especially small) companies, and also with regard to e-government practices[6]. Flanders is even at the bottom of the European league concerning the rate of consumers buying on-line, showing a lag in the private use of Internet;
- There are signs of a digital divide, as a comparatively large share of the population is not yet accustomed with ICT applications.

Thus, **potential** for the IST developments in Flanders is stronger than effective and diffused **usage** (Figure 1.12). Society at large has not realized at full the potential for developments thanks to those IST, which are therefore under-exploited.

On several factors which in the traditional linear conceptions could be labelled as 'input' factors, Flanders scores rather well. This raise the question why Flanders does not perform better on several non-economic aspects that have an impact on the digital Society at large. Or, as Aelbrecht (2001), the general director of Cisco Belgium, has put it: the fundamentals of e-Belgium are there, but there is a lack of "sense of urgency", so that the country has "missed the first Internet train"[7].

Figure 1.12 Potential, Impact and Usage in the Information Society



Source: ICT-Monitor Vlaanderen, 2002

[6] A notable exception is the banking sector, that has been a pioneer in the use of ICT.
[7] As an allusion to the fact that Belgium was pioneer during the industrial revolution, and was the land where the first steam train was put on tracks.

The traditional idea of what leads towards success in Information Society developments, is based on a linear view on innovation processes. In this traditional linear view, development starts with research in ICT, production of ICT-hardware, ICT-software, diffusion of ICT to other sectors, and finally to usage in society at large.

However, in a widely adopted more interactive and systemic view on innovation processes and technology diffusion, the emphasis has shifted from technology-push and production of ICT-hardware towards recognising the importance of demand and the societal aspects because of the pervasiveness of ICT. In this more interactive, demand driven, and systemic view, it is in the end hard to distinguish input from output factors, e.g. in the systems model, innovation may stem from any department of a firm, any sector of the economy or any part of society.

The question to be tackled in the next section of this report is thus: what are the assets and bottlenecks in the Flemish Information Society system ?

2 Success and failures factors for Flanders in Information Society

The second, core question of the study, is that of identification of reasons behind the more and less successful aspects of Information Society in Flanders. Inevitably, because of the multi-dimensional character of Information Society, one has to come with a host of explanatory factors, rather than with a single-factor approach. Economic, historical, social, cultural, institutional, geographical factors all exert a, potentially important, influence on the IST-related developments. In the paragraph below, we propose three main "explanations" or "key driving forces" that we believe exert the most determinant influence on the building of Flanders as an "e-society". Some other dimensions, like the labour market, the composition of the industrial fabric, the costs structure, or the geographical conditions, are not elaborated on here, not that they do not have any importance for the question at stake, but because we believe the three driving forces, taken together, are particularly specific to the Flemish situation, and sufficiently powerful to explain why a somehow unbalanced Information Society development, as described in the previous section, can be diagnosed for this region.

These three critical driving forces are:

1. The "Flemish identity push"
2. The Telecom market and infrastructure
3. ICT-relevant behaviour and attitude.

These three critical forces all involve institutional aspects, economic aspects and cultural aspects. This section is organised in three parts, one for each driving force, for which we subsequently examine the politico-institutional, economic and cultural aspects. The arguments are presented synthetically in Table 2.1 below. They will be examined in detail in the following sections.

Table 2.1. The three driving forces behind the Flemish Information Society and their politico-institutional, economic and cultural aspects

3 driving forces	Politico-institutional aspects	Economic aspects	Cultural aspects
1 "Flemish identity push" Section 2.1	2.1.1 Pro-active policy moves in a complex institutional structure. Recent moves to less linear views on Information Society	2.1.2 Promoting knowledge creation in ICT (IMEC), promotion of clusters impulsing endogenous dynamics	2.1.3 Pro-active promotion of Flemish content in a market with under-critical size: a vicious circle for slow developments?
2 Telecom market and infrastructure Section 2.2	2.2.1 Publicly-led move to make room for Telenet to introduce competition in telecom-market and exploit advantages of the cable density	2.2.2 Dominant position of historical operator, curbing early developments but favouring new ones on the broadband	2.2.3 Responding to the diversity in modes of usage of NICT: the Interactive TV as a solution to the digital divide ?
3 ICT-behaviour and attitudes Section 2.3	2.3.1 e-government initiatives faced with: problems of trust in public institutions, perceived bureaucratic burdens, and complex institutional-structure	2.3.2 Are innovation moods, entrepreneurial environment, education models, and ICT flagships, barriers to develop an ICT-based economy ?	2.3.3 Preferences for the "real" over the "virtual", including real benefits: building a more adapted Information Society model for Flanders ?

2.1 The "Flemish identity push"

The Flemish political leaders have been active promoters of the deep decentralisation of competences that now characterises the country under its federal structure. As mentioned at the start of this report, the Flemish Community has thus progressively gained its own autonomy of decision in most of the areas of importance for the development of Information Society (economic development, land planning, culture, education, etc.), with the notable exception of the regulation of the telecom market, maintained as a federal competence.

With these competences acquired during the eighties, the Flemish Community has decided to take the construction of a "high-tech" image for the region has an important strategic move.

This has consistently been, and still is, part of the project pursued by the successive regional governments: as a result, many programmes and instruments have been implemented in the last two decades to support the advent of the so-called "third industrial revolution" in Flanders. These policies have influenced and supported the development of the Information Society infrastructure, and, subsequently, applications. Multimedia applications promoting the Flemish culture and language have notably been given high priority on the regional policy agendas.

Thus, "High Tech Flanders" as a strong political project, with the aim to forge a distinct Flemish identity, is a strong driving force behind the development of the digital society in Flanders.

However, until recent times, this strong policy drive led to a focus of attention to infrastructure developments and image building (with, e.g. the "technology valleys" concept), but less to real aspirations from potential users. A new balance is appearing now on the policy agenda with the current e-Flanders and other programmes, but the direction of past policy efforts have undoubtedly influenced the present situation, as described in the first part of the report: strong infrastructure and potential, but relatively low rate of usage.

Furthermore, this institutional structure that made those pro-active regional policies possible, also can act as a barrier for the full development of the Information Society: the complicate public governance structure makes it notably more difficult to implement user-oriented e-government applications.

2.1.1 Pro-active policies in a complex institutional structure

The Flemish Community has progressively gained a lot of autonomy in major competence areas impinging on the development of Information Society. Pro-active regional policies have been implemented, that impacted favourably on Flanders' ICT infrastructure and production of ICT hardware, along the lines of the "Flanders Technology" and the "Third Industrial Revolution" in Flanders, the symbols for the new direction that the region needed to take to support its economic take off.

Before going on and looking at those policy efforts, it is worth noting the difficulty to conduct such pro-active policies for Flanders, linked to the institutional profile of the country. Indeed, there is a distance between the institutional and the economic definitions of the regions in Belgium. While Flanders and Wallonia are institutionally independent from the Brussels-Capital region, much activities of direct relevance to Flemish and Walloon actors are located in this region. Easy communication and small size of the territory reinforce the intensity of economic exchanges between the capital-region and the two others. In relation to ICT-developments this is an important aspect because ICT developments are often highly concentrated in core-urban areas. Therefore the two main Belgian regions are confronted with this uneasy situation, that the area of action of some of their policies stop at the borders of the place where critical development take place. The territorial logic, that lies behind the definition of the regions in Belgium, is indeed not very appropriate when it comes to ICT. And the capacities of the small bi-lingual Brussels-Capital region has for long been limited by lags in the definition of an appropriate governance system, thus making it difficult to develop co-operation agreements on a partnership basis. However, the "Community" competences of the Flemish Community (mainly education and culture) can be deployed on the Brussels region, in as far as they concern members of this Community (universities, for example).

Another consequence of the complicated institutional structure of the country is the difficulty in proposing e-government initiatives. As an example, the electronic identity card is a

necessary step to take to allow citizens to communicate with their authorities for a number of operations. As the federal level, the Regions, and the Communities need to agree on such a project, this makes in total 6 entities with their own government, parliament and agencies (federal state, three regions and three communities)[8] that need to develop a consensus on this project.

Despite these institutional complexities, Flemish policy-makers have been active in supporting a number of moves with important consequences on the development of Information Society. Most analysts of the Flemish Information Society pinpoint the high level of policy-awareness in this area. Since a number of years now, it can be claimed that policy-makers have appraised the importance of IST-related advances for the overall development of the region. From a national perspective, this region is certainly ahead of the other two Belgian regions in this area, both with regard to depth and continuity of policy moves.

Going back to the eighties, when early movers in Europe and elsewhere started to make their plans and develop their high-tech base, the situation seemed to be rather unfavorable for Flanders. At that time indeed, the country was busy organizing its new federal structure, rather than launching plans for building up the fundamentals for the Information Society to come. Therefore, national IST-plans in the 80's and early 90's have been quite modest compared to national policies elsewhere in Europe

However, when Flanders began to acquire more autonomy, the policy circles of the time had the idea to develop the image of a new region, based on new technologies, as a flagship for its new identity. The "Flanders Technology" program was launched in the eighties, around bi-annual gigantic fairs showing the high-tech assets of the region. But it rapidly appeared that more should be done to stimulate high-tech developments in the region.

Successive policy initiatives were thus implemented under the newly acquired autonomous competencies. A timeline of the main initiatives and programs is shown in the conclusion. Those programs are:

- The Third Industrial Revolution in Flanders (DIRV) – 1985-1992: a large multi-annual framework program encompassing the various initiatives to push technology developments in the region;
- Creation in 1984 of a large regional research center, IMEC, a leading research center specialized in fundamental and applied research in micro-electronics. Part of the missions of IMEC is to develop relations and services for the Flemish businesses, in the area of ICT, including the incubation of research spin-offs (IMEC is discussed in more details below);
- Flanders Technology, the big regional technology fairs and awareness-raising events for the "high tech", organized with a lot of media coverage and publicity at the end of the eighties and beginning of the nineties;
- Clusters, later transformed into "Technology Valleys", policies, with the aim to support the creation and growth of agglomeration of firms specialized in related activities and technologies. Most recently, VIS became the more generic policy tool to promote clustering.
- The Medialab program (launched in 1994), a research and demonstration center specialized in the analysis of the societal aspects of multimedia technologies;
- Impulse programs in areas related to ICT developments, e.g. the Action Program for Information Technology ITA (1995-1998, and 1999-2002), supporting R&D projects by

[8] The total is 6, since the Region of Flanders and the Flemish Communities have merged.

enterprises in the ICT field, with the aim to reinforce the competitive position of Flemish companies in those sectors;

- The Multimedia Demonstration program (1998), offering support to firms, associations, education establishments, etc. for demonstration programs;
- Creation of a second telecom operator covering the region, Telenet, with a broadband network based on the exploitation of the TV cable, in 1996 (first operation in 1998) (discussed in more details in section 2.2.1);
- The PC-KD program in 2000, with the aim to equip schools with PCs and train teachers as well;
- The KMO-ICT plan (2001), aiming at reinforcing familiarity and absorption capacities for ICT in SMEs;
- The global Flemish portal site for e-government;
- A recent important program for the development of e-government applications;
- The "Digital Home Platform" project, run by e-VRT (the R&D company of the regional TV operator) launched in 2000, with the aim to offer interactive TV services as a complement to traditional forms of access to Internet and electronic services, currently in a pilot test phase with 100 households in Flanders.

The observation of the evolution of these policy moves shows a growing awareness of the need to pay priority attention to users' needs, in conjunction with technological developments.

Currently, the policy statement of the latest elected government in 1999, and subsequent policy programmes of various Ministers all underline the wish of the Flemish government to sustain efforts in the view of placing the region firmly in the lead group of regions in the new digital society. Recently, the e-Fl@nders (Digital Action Plan Flanders) has been developed as an overall framework programme to reach this goal. The spirit of this policy (launched during the period in which Belgium chaired the EU) is very close to that of the e-Europe action plan 2002. Besides the ambition to move ahead towards a leading position among countries in Europe along the e-Europe indicators, the e-Fl@nders initiative puts a stronger accent on the struggle against digital exclusion, and on the economic importance of the ICT sector. The priorities of e-Flanders are:

1. High quality and accessible infrastructure
2. Top quality human resources
3. Development of key aspects of "Digital Flanders":
   - e-government
   - ICT use in companies
   - R&D in ICT
   - Development of an ICT industry through growth of starters and existing enterprises
4. Inclusiveness and democratization of information society

In addition to these four action lines, a fifth aspect of the programme consists of monitoring activities, e.g. in order to produce regional-level statistics on the Information Society in Flanders.

This framework programme for Information Society in Flanders, testifies the gradual move from infrastructure and hardware aspects, towards the diffusion and usage of ICT in the wide population. It has as an explicit goal to help the region catch up with the development of other regions in Europe. It also shows a willingness to come up with more "holistic" Information Society policies, creating synergies and complementarities between the actions of various governmental departments, rather than seeing it as a vertical area that "belongs" to one Ministry or administration. Whether this challenge will be met despite the traditional departmentalisation of ministries, is an interesting aspect to observe for the future. At the moment of writing this report, the ministries were organising the set-up of a cell in charge with this horizontal co-ordination, but was still at a preliminary stage of operation.

From this historical view on IST-related policies, one hypothesis for the good performance of Flanders in the development of an IST infrastructure, is thus the explicit political will to undertake a pro-active regional policy in this area. According to some view, "*without the political will 'to do something' in this field, the Flemish community would still be lagging behind*." (van Bastelaer et al., 1997). Most of the experts interviewed for this project shared this opinion.

While this sounds like an overall positive approach, the fact that Flemish policy approaches have, during a long time, put an imbalanced emphasis on the support to ICT production and infrastructure, at the expense of policy instruments for ICT diffusion and appropriation in the private sector, has still its impact on the present situation. The study of the multimedia sector in Flanders in 1997 concluded that "(*public promoters') initiatives are mainly concentrated on hardware and technology. Roughly only 10% is devoted on software and content*" (van Batselaer et al., 1997). Recent policy moves under the e-Flanders, the PC-KD or the KMO-ICT programmes, show a willingness to correct those weaknesses.

2.1.2 The economic aspect: promoting 'high-tech' clusters in Flanders

One remarkable element of the public strategy to promote a "High-Tech" Flanders, is the creation of IMEC, a leading research centre on ICT. Besides performing excellence research in this area, the idea is also to favour new firms creation and economic spill-overs around this high-tech node. The support to the creation of an ICT sector to renew the industrial fabric is also part of this strategy, notably through the promotion of the so-called "technology valleys". Nowadays the concept of "technology valleys" has been transformed into the more modest "Flemish Innovation Co-operation Platforms", with the same aim to create synergies between regional actors in innovative activities, with perhaps less accent on the policy side, on visibility, but more on tangible results. Positive cluster dynamics in ICT are indeed present in the region, and favour endogenous growth potential, in a region dominated by the operation of multinational companies.

2.1.2.1 IMEC: a key actor for knowledge creation in ICT

One crucial element of the Flemish Technological and ICT policy is the creation in 1984 of an international excellence centre in microelectronics, IMEC. IMEC's mission was to perform scientific research that runs 3 to 10 years ahead of industrial needs in the area of microelectronics, nano-technology, design methods and technologies for ICT. With a staff of over 1200 persons and turnover around 120 Million €, IMEC is now the largest independent research centre on micro-electronics in Europe and one of the largest in the world.

The title of a recent evaluation of IMEC pinpointed the challenge faced by this institutions "Tackling the paradox: can attaining global research excellence be compatible with local

technology valorisation?" (Van Helleputte and Reid, 2002). The evaluation found that the scientific quality of service given by IMEC to most advanced, largest companies involved in ICT (mainly through research contracts), was very high, while the transfer of knowledge to smaller companies was hampered by their limited absorption capacities. Thus the bottleneck here does not seem to lie in the supply of new knowledge, but rather in the demand from companies. Another bottleneck for the diffusion of new knowledge from IMEC to Flemish companies, is the small size of the regional market for this research institution. The creation of spin-offs is a successful aspect of IMEC's mission, notably since the creation of an IT-oriented group of venture capitalists was added to the strategy. This is the most visible result in terms of "return on investment" for the policy-makers, and it has been reinforced beginning of 2002 with the creation of a new department on "industrialisation and incubation" with the aim to reinforce the flow of know-how and technology to Flemish SMEs. A less visible sort of spill-over concerns the high rate of labour-mobility (17% change per year on average). About a third of the attracted new talent comes from abroad; while between 65-70% of the people leaving IMEC find new jobs in Flanders.

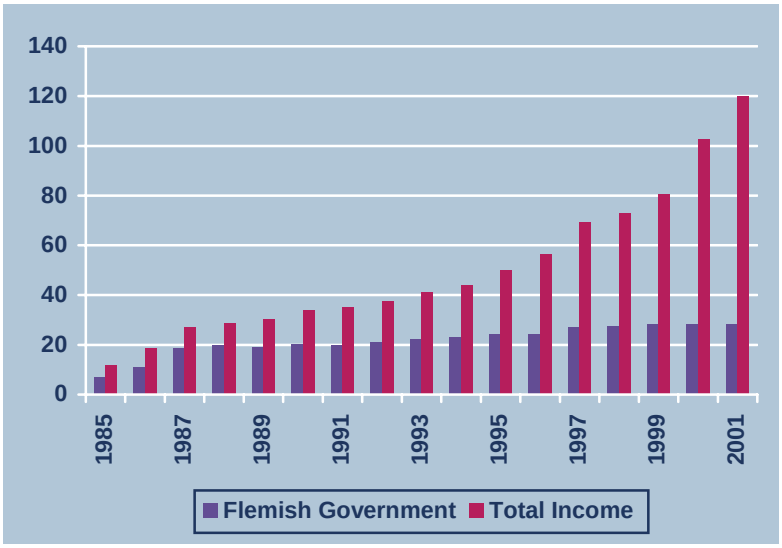
Moreover, a sophisticated model of IPR management was introduced[9] in order to increase the possibilities for regional contract-research, and recently IMEC proposed the creation of specialised 'ADS' (Application, Diffusion, Support) cells which will have an interface role between the scientific personnel of each division and SME's. In short, the evaluation found out that IMEC's mission of new knowledge creation is a success, while local technological valorisation less so, and that this is not so surprising because the two types of missions are not necessarily fully compatible under one roof. This analysis is coherent with the diagnosis above, of a region strong in ICT research and production, but less strong in ICT diffusion throughout the whole economy. But one can hardly blame IMEC for being successful in its main mission.

In 2001, IMEC's self-generated income (apart from the Government grant) rose by 22% to 91.1 million €. Today, IMEC generates 76% of its total budget, the remaining 24% being funded by the Flemish community (Figure 2.1). The financial sustainability of this institution looks thus high.

IMEC's income from international bilateral contracts amounted to 40 million € in 2001, which accounts for 44% of IMEC's self generated income. The income from bilateral collaboration with 72 Flemish companies grew in 2001 to 30.27 million € or 33% of IMEC's income generated from the market (Figure 2.2). The increasing importance of the Flemish industry matches the mission of IMEC to also support technology development in the Flanders region, and it is a remarkable performance given the strong trend of globalisation regarding the other part of the mission. One explanation for the increase in regional contract partners is that the share of the number of new contract partners outside the ICT and (micro)electronics industries has increased to some 30 percent for the period of 1995-2000, this development points at the multi-purpose of the technologies concerned.

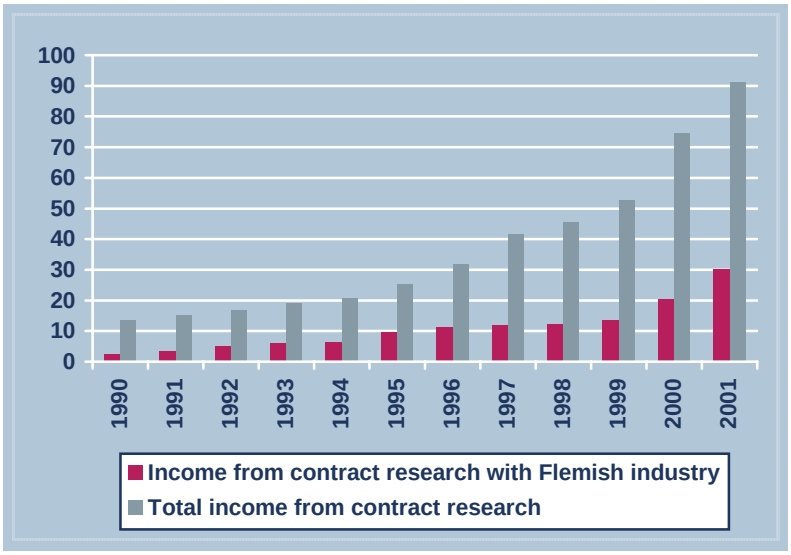
[9] See "Trends in the ICT world and impact on IPR – the IMEC case" (Van Helleputte & Robeyns; OECD, forthcoming)

Figure 2.1 Evolution of IMEC's total income 1985-2001, in million €



Source: Van Helleputte & Robeyns (forthcoming)

Figure 2.2 Evolution of total income from contract research between 1990 and 2001 vs evolution of income from contracts with the Flemish industry in the same period



Source: Van Helleputte & Robeyns (forthcoming)

A tricky question on the role of IMEC in the overall development of Information Society in Flanders is: what can be the effects of a concentration of resources on a single institution? Are the economies of scale (and scope) likely to offset possible lock-in effects? Is the focus on the "centre" compatible with attention to wide diffusion? This discussion resembles the dilemma other countries have with their 'National champions'.

2.1.2.2 Flanders Language Valley: Development of a localised node in a globalising network of ICT Clusters

Flanders Language Valley (FLV) is an ICT cluster which had developed between 1994-2000 in Ieper, a town situated in the rural periphery of Flanders. During 2000 this ICT cluster entered a crisis due to corruption and financial problems, mainly concerning its core firm Lernout & Hauspie Speech Products (L&H). After describing three phases of development, we discuss several lessons which can be learned from this case.

The first phase in the development of Flanders Language Valley concerns L&H, a pioneering ICT firm. Its founders Jo Lernout and Paul Hauspie made the initial choice of technology and location. After several years of work outside Europe, they returned to their home region, met in Ieper and decided to do business together in language- and speech technology in 1987. Jo Lernout had worked with Bull & Wang computers on a technology to codify natural speech, but it focused exclusively on English. Within the multilingual context of Belgium and Europe, L&H focused on a multi-lingual technology. They started their company in a building set up by the regional development agency (GOM) as a regional employment project. The first years of research and development were funded by 'regional' and mostly informal Venture Capital, which accords with the inherited entrepreneurial mentality this area in West-Flanders is famous for. GIMV, by then the Flemish regional Investment Company was the first main institutional investor.

During the growth in 1994 L&H sold licenses, opened offices in the US and started to acquire other pioneering companies. After years of internal orientation, the autarkic, closed mentality made room for a network mentality. In the beginning of 1995 L&H got many requests from clients wanting access to their R&D core, the language laboratory in Ieper. A lot of small firms had signed license agreements in order to integrate L&H technology with their own technology. Therefore, clients began visiting Ieper, usually for several months.

After L&H had adopted a network mentality a second phase started with the FLV initiative in 1995. A venture capital fund (the FLV Fund), focusing on speech and language related technology applications, was part of the concept. About 50 companies from Asia, the US and Belgium contacted FLV Fund. Out of these requests six to seven concrete opportunities were selected. This is an important point, since the screening procedure typically canvasses the opinion of L&H and the other firms in order to validate the technological and commercial capabilities of potential candidates to see if there could be some common interest or complementarity. After only three years of dynamic technological clustering through licensing, and financial clustering through participations, several language and speech related technology firms had clustered in a geographical sense. In 1999 the first group of firms were located at a Campus on a 65-acre business park in Ieper. The favourable communication conditions induced localised innovative linkages. Companies 'found' each other at FLV to their mutual advantage. They learned from each other and benefited from using and developing common pools of resources in proximity, e.g., companies found employees in the 'collective pool of labour' created by many education and training programmes. In 2000 more than 40 young, growing, innovative, FLV firms were listed in the FLV Fund portfolio of which a dozen are supported by the incubation services of the FLV Foundation. The two most important tasks of the foundation in those days were to create the infrastructure and to increase the availability of human resources for language and speech technology in the region. The Foundation was subdivided into 12 organizations. FLV Education took care of many training and education programmes in co-operation with several other existing training institutions; FLV Finance co-ordinated the start-up activities of a number of local Business Angels; FLV Telecom provided telecommunication infrastructure. Thousands of high-bandwidth internal access-points were installed at private households in the vicinity, in

exchange for active participation in testing of products of FLV companies. As a result even more interactive user-producer relationships were localised within the regional tissue of the Ieper area.

As of November 1999 the cluster announced to enter a third phase, one of exploitation. The foundation had planned to replicate and localise the FLV concept in 9 international centres of excellence, aiming for a worldwide network of centres. The financial and management crisis at L&H in 2000 has however brought the development to a halt.

Three key questions can be asked in face of this (aborted) success story:

1. Why did FLV develop in such a small, relatively isolated rural area and not in a region with a much stronger knowledge base, such as Leuven (where IMEC is located)?

It seems that the technological idea and assistance for L&H was destined to come from foreign sources so, from a technological point of view it did not really matter if the company was located in a bigger centre in Belgium or not (apart from the fact that an airport might have been convenient). However, the entrepreneurial spirit, the availability of venture capital in the region and the multi-lingual aspect can be conceived as regional specific advantages on which the success of L&H and its technology is partly based. Actually the strong family-oriented business ethic seemed crucial with regard to the faith of local private investors putting money into their vision, i.e.: would Lernout and Hauspie have succeeded in persuading local butchers and bakers in a community they were not familiar with, like Brussels or Leuven ? Social links drew and 'tied' them into Ieper. Another point is the fact that the human resources needed by the cluster were scarce in other regions as well, so the cluster firms had to invest in training and education anyhow and the presence of a large unused labour reserve in the Ieper area may have helped in this respect. This 'answer' has an important policy implication, with potential relevance for candidate countries: despite the crisis, the FLV case shows that even peripheral regions without a strong and preferably diversified knowledge base may have an inherent potential to generate innovative clustering in a modern industry. Moreover, from a public point of view it did not cost a lot of public funds to get the clustering process started.

2. Why is it that geographical proximity remained important in the case of FLV?

When explaining innovation clusters quite often reference is made to tacit knowledge and un-tradable technological interdependencies. In the case of FLV one would expect that the knowledge at hand could be codified and sold through licences? However, the FLV case shows that even the exchange of codified knowledge in the form of licence agreements can be a highly localised learning process. As "we can know more than we can tell" (Polanyi 1966, p. 4), L&H knew more than it could sell and their clients wanted more than they could buy through licenses. The need for face-to-face contacts in order to better interact and exchange the tacit knowledge which is used to combine the codified knowledge started to attract other firms with similar and complementary technologies to Ieper. Over time, later in the life, whether it concerns the life of a young firm, cluster or technology, more and more tacit aspects may become codified and standardised. The idea that firms and clusters evolve and mature, suggests that private and public policy has to evolve and mature accordingly: e.g. through providing a learning opportunity early in life by investing in infrastructure and education and support 'start-ups'. Later on, a reduction in market failures weakens the arguments for policy intervention.

3. What then is the role of public policy?

Although FLV received public support and FLV has even served as a flagship of Flanders cluster and high-tech policy, FLV is not a policy invention. Although the present crisis of

FLV does not seem to be based on problems related to technological or locational choices, it does question public support to this very risky kind of clustering. A policy lesson then is that the clustering may have been too much, too fast or too specific in technological, organisational or geographical sense. The FLV case shows that the new network economy offers opportunities for economic entities (firms, clusters or regions), which lack a strong and diversified knowledge base to overcome the problem of 'critical mass' by opting for a highly specific 'niche'-strategy. However, referring to Arthur's law of the New Network Economy: "of networks there will be few" (often translated in "the winner takes all"), there is a high risk of supporting a cluster that does not win. Another policy option would be not to frustrate private peripheral 'experiments', and provide a more generic temporary support to start-up phases, focusing on infrastructure and education, which may still be useful in case the clustering firms fail to survive or in case they leave.

2.1.2.3 Positive clusters dynamics help construct true endogenous dynamics in an economy with large degree of foreign control

An hypothesis for the good prospects for ICT sector development in Flanders could be that cluster dynamics are at work, that provide a favourable context for new companies creation and the development of synergies between existing and new firms, as well as other actors (research and training institutions). IMEC played an important role in initiating and nurturing some of those clusters dynamics, in attracting foreign investment in the sector, and in upgrading the qualification of labour force involved in R&D in this sector.

Flanders has also seen, in the recent period, the development of a number of agglomerations of firms, specialising in high-tech niches and co-operating both among them and with knowledge institutions. The positive aspects of these ICT-clusters, promoted and supported by the government, like the above-described Flanders Language Valley, or the Digital Signal Processing Valley and Flanders Media Valley constitute opportunities for endogeneous growth, embedded in the Flanders's innovation system, and based on rather small networks of highly specialised SME's.

On the policy side, it is obvious that innovation always involves risk, but temporary cluster support does not involve large sums of public investments, and relies mainly on firms dynamics. To the contrary, structural, long-term subsidies as is the case notably with IMEC but also the automobile industry, run the risk to lead into a sort of policy lock in, into supporting 'national champions' which might 'globalise out of the regional tissue' and become less well embedded in the innovation system as a whole. However, the latest figures on contract research by IMEC for firms in Flanders are reassuring in this respect.

The peculiar story of the Flanders Language Valley, that once upon a time was raised as the flagship of the home-grown, "genuinely Flemish" company able to drive the development of a region into a high-tech society, ended up as a failure. As the growth or the 'gains' of the cluster was rooted in the region, so were the 'pains' from the failure, e.g. many people lost their private investments when the value of their stocks collapsed. The loss of this flagship has had an impact on the attitude of venture capital investors towards promising ICT-start-ups. Nevertheless, even if the cluster experience proved not to be sustainable, it has shown that creating ICT-clustering dynamics in the "periphery" can be done. But the case at hand also shows that the role of policy-makers should be to facilitate such dynamics, rather than to "pick the winners". Support to clustering is a way to let variety grow and may be a good way to increase the necessary absorption capacity, in companies. The recent cluster-policy in Flanders has moved towards a more generic and more transparent policy instrument, leaving primacy to bottom-up dynamics.

2.1.3 The cultural aspect: a small market in Flemish content: a vicious circle?

There is a difference between situations faced by English-speaking Internet users, or those coming from big markets, and others. As the Flemish language is a "small language", and the region of limited size, it lacks the critical mass for the development of applications and contents, specific for this market. Therefore, for a number of users that value own-language and "local" information, the value of being connected is lower than for those who can freely access the information in English and the other languages present on the Net, or for those living in bigger markets with less diversity. In an Eurobarometer survey from 2000[10], Belgium was, together with Greece, Portugal and Spain, among the countries where Internet users most often reported being hindered by absence of sites in their own language. By the same token, such complaints indicate that there is a demand for local content.

As put forward in (De Vil et alii, 2002), a vicious circle phenomenon occurs when "*there are relatively few internet users because of the lack of domestic content but there are few incentives to create local content because there are few potential users*". For a quasi-autonomous and culturally distinct region as Flanders, the relevant borders for information search are more frequently the regional (rather than national) borders. The data in Table 2.2 below show light on the relatively weak development of Internet content in Belgium. However, when recent initiatives such as e-VRT will produce their effects, the situation could be changing rapidly.

Table 2.2 Indicators of Web content development in Belgium (2000)

	Belgium	European Union	United States
Number of Internet Sites per 1000 inhabitants (generic Top level Domain)	4.1	6.2	27.0
Number of multimedia sites per million inhabitants	117.3	130.8	578.0

Source: De Vil et alii, 2002

The exiguity of the market has also been used as an argument to explain the lack of adequate ICT-services for Flemish companies, since companies involved in ICT are forced to act in a wider market.

2.2 The Telecom market and infrastructure

The second driving force behind the shape of e-society developments in Flanders is linked to the particular situation in the telecom market and infrastructure of this region. Two main elements must be noticed here: the first is the presence of an alternative telecom operator, Telenet, installed by the authorities to cover the whole region with a complete infrastructure, based on the exploitation of the TV cable network; the second is the existence of a (still) dominant operator, Belgacom, the historical national telecom company.

In both respects, the situation of the region is remarkably different than elsewhere in Europe: no other country or region has established a similar alternative operator[11], and the rate of liberalisation of the telecom market is generally less advanced in Belgium than in other EU places.

[10] Flash Eurobarometer N°88 "Internet et le grand public" 10-30/10/2000.

[11] The federal Council for Telecommunications even states that the Telenet network is unique in the world (Annual Report 2001).

The impacts of this situation on the move towards the Information Society in Flanders, can be analysed as follows.

A first point relates to the history of the development of the Information Society, in the past decade or so. The persistent dominance of the historical telecom operator during this period, with associated monopoly prices on telephony, have contributed to high Internet access prices, impinging on connectivity rates of the general population and SMEs, at times when dial-up was the dominant mode of Internet access.

A second argument looks at the other side of the coin: thanks to its long-standing quasi-monopolistic position, Belgacom has been able to maintain a good financial situation, and to engage in an active policy for the development of broadband infrastructure with the ADSL technology. Telenet was at the same time developing an alternative broadband offer, based on TV cable, with as a result, the emergence of a fierce price competition between the two operators to capture the new market of Internet access through broadband, at the end of the nineties. Consequently, Flanders now holds a leading position in Europe with remarkably high number of users linked to Internet through broadband connections, as evidenced in the first part of the report. This certainly constitutes an overall advantage for Information Society developments, although a saturation point in terms of number of Internet users seems to have been reached recently.

The third element is a more prospective one: will the policy-driven efforts to develop interactive TV at regional level, be the corner stone to bring the rest of the population into the Digital Society ?

This discussion on infrastructure and prices should no hide the important question of content: unless attractive and useful applications are proposed through the various media to approach the Internet, any progresses in infrastructure provision or pricing are likely to fail in bringing the expected goal of creating an inclusive Information Society, enshrined in the e-Fl@nders plan.

2.2.1 A voluntary policy move to introduce a regional alternative telecom operator: opening and broadening the market, but at what costs?

As mentioned above, the Flemish government decided to establish its own telecom operator in the mid of the nineties. Telenet has been established in 1996 with the aim to provide telephony and Internet access, using the TV cable network, that was already available on the vast majority of the regional territory. This policy move is in contrast with the situation in Wallonia: in this region, the management of cable network is split between a multiplicity of operators, preventing them to reach the critical mass necessary to undertake the investments that would allow them to offer telecommunications and interactive services in addition to traditional TV programmes.

Much political will and some public money, followed by private investments, have made this endeavour a reality in Flanders. Telenet has developed pioneering work in the use of cable technology for telephone and Internet services[12]. As a result of these efforts, Flemish consumers have now the possibility to switch from the traditional telecom operator towards this new one.

Whether the project will be a full success, is still to be confirmed. For one, the huge investments that have been made to build the service, have not yet been matched by sufficient

[12] According to some sources, only Australia has developed similar technology, with as a result a limited competition and high prices for the specific equipments.

revenues. The heavy losses announced during Summer 2001, and the recent problems shown by Telenet during the Summer 2002, where the company underwent an important threat for lack of capacity to attract necessary funds to survive, show its fragility. This straight financial situation deprived Telenet from the possibility to enter into a war price with Belgacom on phone pricing. As a result, prices fixed by this alternative operator have generally stayed very close to the monopoly prices of the incumbent operator, yielding thus only marginal benefits for the consumer. With the growth of the mobile phone market, Telenet now finds difficulties to reach the market share needed to reimburse its huge initial sunk costs. The system is also characterised by important fixed costs for installation, making it costly to switch swiftly between Belgacom and Telenet. As a result, a situation of duopoly has been created, leaving those claiming for a more liberalised telecom market, with much unsatisfaction.

It is on the other hand true that, without the presence of Telenet on the newly created broadband market, Belgacom would not have been led into a price war with the aim to capture this new market. As a result, broadband prices have been maintained at a remarkably low level, to the benefit of the consumers.

2.2.2 The double-sided effects of the situation with the historical operator: curbing early developments but favouring recent ones

Belgium has been one of the last countries to open its telecom market to other operators than the historical operator, Belgacom. The degree of liberalisation of the Belgian telecom market has persistently lagged behind that of other European countries (Table 2.3). In a recent position paper (25th July 2002), the Belgian Association of Internet services providers (ISPA) claims that "*in today's Belgian market environment the appropriate regulations are not existing NOR foreseen to allow a liberated Internet market in line with EC's philosophy and frameworks*" and that "*there are great risks and even ascertained threats that those un-sustainable competitive conditions will very soon result in absence of competition due to absence of competitors, which in turn, will inevitably mean the absence of innovation, freedom of choice and hence penetration of Internet in the Belgian society*". The Belgian consumer association "Test-Achats/Test Aankoop" is of the same opinion, as it writes in October 2002 that "*liberalisation of fixed phone market is a failure for the household subscriber*"[13].

The main arguments of ISPA are that: Belgacom is abusing from its dominant position in the telephone market to place its own Internet offer; because the company is the owner of the local loop, it is able to retain an unjustified share of customer revenue (65%) while supporting low part of the costs; Belgacom is building a dominant position in the ADSL market too and erecting barriers to other Internet Service Providers by imposing such a high wholesale price that no alternative operator can cover the fixed costs to enter the ADSL market.

[13] Test-Achats, n° 458, October 2002.

Table 2.3: Evaluation of liberalisation of telecom market (2000)

	EU mean	BE	FR	DE	EI	NL	DK
Overall liberalisation score	66	65	68	67	68	75	90
Effective regulation	17	15	18	14	17	19	20
Fair interconnection	16	17	17	18	16	18	22
Infrastructure competition	19	19	21	21	21	23	24
Non-discrimination	14	13	12	14	14	15	24

Source: British Telecom, The Liberalisation Milestones, 2000, cited in PricewaterhouseCoopers, 2001

Belgacom responds to those arguments that the national regulator (IBPT) is not playing a positive role in this debate, since application rules for the regulations are not clearly set: some proposals for price reductions by Belgacom have not been agreed, on the ground that they were not reflecting real cost conditions. Belgacom also retorts that it is contradictory to deny the company at the same time, the right to fix low or high prices, both on the ground of abuse of dominant positions. Concerning ADSL, the argument is that the prices fixed have helped to create a new market, with great success. Belgacom is also demonstrating the reality of the cost-based approach for price fixing, on the basis of technical arguments. Moreover, contrary to many operators elsewhere, the financial situation of the company is sound, allowing it to invest in future developments. Finally, the company points to other factors than pricing arguments to explain lags in Internet penetration: according to empirical observations, it seems that the Belgian consumer has a very low price elasticity for phone consumption (important price diminutions in 2000 did lead to marginal changes in consumption patterns).

Beyond this technical debate, it cannot be denied that high Internet access prices for traditional dial-up connections can be taken as one explanatory factor for Flanders' lags in Internet penetration in the first times of Internet penetration. According to empirical analyses performed by OECD, there is a clear negative correlation between the cost of Internet access and Internet host density, and "*those countries that moved early to liberalise their telecommunications industry now have much lower communications costs and, consequently, a wider usage and diffusion of ICT technologies than those that followed later on*" (OECD, 2001, p.29).

The costs of Internet access through classical phone lines can be divided in three parts:

- Fixed costs
- Communication costs
- Charges of Internet Service provides

The latter part has tended to lose significance nowadays, as the number of ISP offering free access has grown rapidly. As concerns the two other parts, Belgian telecom prices have persistently stayed well above EU means, as shown in Table 2.4[14]. More recent, unpublished data, computed in 2002 by the Belgian consumers association Test-Achats, still place

[14] Table 2.3 presents figures for residential phone charges; the position of Belgium remains identical when business phone charges are taken into consideration.

Belgium amongst the most expensive countries, on a 5th position amongst the member states, after Portugal (the most expensive), Spain, Italy and Austria, with a basket price of 137, as compared to an index of 100 for the less expensive country, Denmark. Another element to be taken into account, is the very low density of phone connection in Belgium, ranked in 2001 at the 13th position in a ranking of EU countries published by the Federal Council for Telecommunications (Annual Report 2001, p.58).

Table 2.4: Telecommunications pricing (2000)

	Basket of residential phone charges: fixed charges in US $ based on PPP	**Basket of residential phone charges: usage charges in US $ based on PPP**	**Basket of residential phone charges: total charges in US $ based on PPP**
PT	241.79	286.9	528.69
IRL	230.13	216.23	446.36
BE	**215.89**	**229.53**	**445.43**
IT	180.6	259.45	440.04
GR	137.25	302.32	439.57
ES	186.27	253.15	439.43
AU	233.31	176.36	406.67
EU mean	***182.52***	***185.93***	***368.46***
DE	157.39	202.45	359.84
FR	146.76	208.57	355.33
NL	202.79	141.38	344.17
LU	175.65	151.3	326.95
FI	156.61	162.47	319.08
DK	173.9	119.31	293.21
UK	201.28	84.73	286.01
SE	142.54	115.17	257.72

Source:OECD (2001), Communications Outlook

The above data referred to traditional phone line use, for voice traffic. Tariffs for Internet use over the phone are in many cases different from the tariff used for voice traffic. For these tariffs too, Belgium show a very high price structure, as it is constantly located amongst the most expensive countries, especially for peak-hours use (Table 2.5).

Table 2.5 Internet dial-up access costs (residential user): 20 hours/month

	USD/PP and rank of Belgium (1=most expensive country) **Peak hour 1998**	**USD/PP and rank of Belgium** (1=most expensive country) **Off- Peak hour 1998**	**USD/PP and rank of Belgium** (1=most expensive country) **Peak hour 2000**	**USD/PP and rank of Belgium** (1=most expensive country) **Off- Peak hour 2000**	**USD/PP and rank of Belgium** (1=most expensive country) **Off- Peak hour 2001**
EU-15	64	46	42	32	29
BE	**98 (2)**	**47 (7)**	**52 (3)**	**36 (4)**	**37 (2)**

Source:Information Society Statistics – Pocketbook 2002.

The above discussion and data relate mainly to the "smallband" access to Internet, which has for long been the only way to access it, and subsequently remained the dominant form until recently, when broadband connections (through either phone line or cable) have been put on offer on the Flemish market. While classical dial-up connections coupled with subscription to free Internet providers still constitute the cheapest option for light users, ADSL and broadband become more interesting when usage increases. International comparisons of ADSL pricing are compounded by difficulties linked with the different composition of the service (speed, size limits, etc.). Nevertheless, recent data computed by Test-Achats/Test-Aankoop show that the Belgacom tariffs are, this time, amongst the cheapest from all European countries[15]. ISPA interprets this as an abuse of dominant position, with the aim of limiting competition on this market through internal cross-subsidies within the company. Nevertheless, for heavy Internet users in Belgium, there is now a much better –priced solution on offer, through ADSL. This solution is currently available to approximately 93% of the country population (le Soir, 17 October 2002).

Cable access prices in Belgium are also comparatively much better aligned with EU average, with Belgium occupying a fifth position among the 12 countries offering such possibilities in Europe, according to European Commission data of December 2001[16].

In absolute terms however, broad band access is always more expensive than dial-up connections, leaving out of the game that part of the population that cannot afford a share of telecom expenses in the household budget above a certain limit.

Thus, it can be suggested that the high dial-up costs may have favoured the early, faster shift towards broadband, both through ADSL and cable, in Flanders. The price structure for the two types of connections, "small" and "large" band, in Belgium is such that the difference is much thinner than elsewhere, thus favouring a migration of (part of) Internet users from the narrow to the broad band.

Indeed, the latest data on Internet penetration produced by ISPA (September 2002), presented in section 1 of this report, enlighten the rapid switch occurring in Belgium, from phone lines

[15] Monthly rents do not however, take into account the installation costs, for which Belgium ranks again as the second most expensive EU country after Luxembourg, with an index of 359, to be compared to an index of 120 in the Netherlands.
[16] European Commission (2002), E-Europe – Benchmarkingsverslag, COM (2002) 62.

to broadband (ADSL+cable): new broadband connections are growing while the number of phone connections are continuously declining. Mid-2001 already, the number of broadband connections for households bypassed the number of narrow band paying connections. In fall 2002, more than 70% of business connections were of the broadband-type, 44% of households have turned to broadband, and those percentages are increasing very rapidly. With such high percentage of broadband connections, Belgium is leading the European league. Thus the high price for dial-up connections in Belgium should not play such an important role in explaining present and future rates of Internet connection in Flanders, at least for that part of population that can afford to pay the fixed price for those connections, which eliminates the lower segment of consumers. That part of the population is at risk to be left out of the game and remain Internet-illiterate.

The relatively high share of Flemish Internet users connected through broadband access with permanent connection should impact positively on the behaviour of users. According to (Horrigan et Rainie, 2001), broadband residential Internet users "*spend more time online, do more things, and do them more often than dial-up users*" in the United States. In particular, they more often become creators and managers of online content. Thus, an increasing proportion of Internet surfers connected through broadband in Flanders is likely to upgrade the intensity and widen the scope of their use of Internet.

2.2.3 Pro-active content promotion using "new" infrastructure": a way forward to the inclusive digital society?

As mentioned above, more choices and price changes in the telecoms market, have not yet resulted in a "sufficient" rate of Internet penetration, at least when overall rates are compared to those reached in more advanced EU countries. ISPA calculated that the maximum Internet penetration rate in Belgium will be stagnating around 46 %, i.e. 20% lower than in Scandinavian countries. Those left out are at risk to stay at the margins of the Information Society. In section 1, data have been presented that showed that the digital divide, mainly by age and level of education is a reality in Flanders.

Specific elements of the Flemish context act to reinforce this digital divide:

- a low employment rate of older workers. Belgium has the lowest rate (around 25% in 2000) of all Europe (around 38%[17]) of employment of workers aged between 55 and 64. The country has been singled out recently in OECD reviews, because of the danger and costs of such situation. Older people not in the workforce are faced with less opportunities to get familiarised with IT applications.
- A high tax rate for low-wage earners (50% for Belgium, as compared to 39% for the EU[18]). For this indicator, Belgium occupies again an extreme position in the European league. This is a negative factor as regards the possibilities of the poorest segment of the population, to afford expenses needed to enter into the wired world.
- A scarcity of Public Internet Access Points (PIAPs): Belgium is among the countries with the lowest number of PIAPs per 1.000 inhabitants, with figures of 0.06 in January 2001, as compared to 0.54 for Finland, 0.46 for Finland, or 0.39 for Sweden[19].

To tackle this digital divide problem, a new voluntaristic strategy is being implemented by the Flemish government, as mentioned above: the development of new modes of connection and

[17] Data taken from EU structural Indicators, 2002, source Eurostat.
[18] Idem.
[19] European Commission, Information Society Statistics Pocketbook, 2002.

usage of new IT applications via the interactive TV. A pilot project is underway at the moment of writing this report, with the aim to test the feasibility and effectiveness of this new entry point into the Information Society. The reasoning behind this strategy is linked with the idea that the needs and capacities of various categories of people are different: for some, using a familiar terminal such as the TV, under user-friendly modes of access and with the attraction of appealing applications, is believed to be the best way to get connected. The television channel might be a way to overcome a possible historical bad perception linked to phone use and anxiety in face of PCs, that would characterise part of the population. The current trial with a limited set of households has combined the technical aspects of turning the TV into an interactive device, with applications proposals (such as emails, e-government, e-banking, etc.), in order to present the digital society as something that is more than just technical offers.
This is one current challenge that the Flemish authorities have set for themselves. It is also a main strategic development area for Telenet. Future will tell is this is a success or if other barriers still need to be overcome to reach this critical mass of wired citizens needed to develop e-government, e-commerce and other people-centred applications.

2.3 ICT-relevant behaviour and attitude

The third driving force which seems important in explaining the position of Flanders in the Information Society concerns ICT-relevant behaviour and attitude. This is an explorative section of the report, as such factors are hardly measurable. In the next paragraphs some social and cultural data are introduced to indicate behavioural factors that could explain some of the observed weaknesses in the uptake spread and diversified use of IST in Flanders . This is a tricky exercise there is a danger to simply turn to deterministic arguments like all Flemish think, feel or behave in a certain way. However, it remains that some essential explanatory ground has been untouched in this and other reports on the information society in Flanders so far. The strong ‘potential’ based on traditional input-factors like wealth, ICT-infrastructure, ICT-research and ICT-production, coupled with a lack in a widespread, diversified ICT-use, especially in households and small firms, calls for a multi-disciplinary approach to explore additional explanatory factors in order to gain more insight in the barriers to usage of IST in the Flemish society.

First, possible relationships between the trust in public institutions and the progress in e-governance are explored (paragraph 2.3.1). A next paragraph deals with behavioural factors which have more direct economic implications, e.g. concerning innovation and entrepreneurship (2.3.2). In paragraph 2.3.3 potential explanations for the low use of ICT at home, that is, after work, for leisure or consumption, are proposed.

This section cannot provide decisive conclusions on such intangible factors. However, there are some signs in the data collected that specific behaviours or attitudes have an impact on how Flemish citizens prefer to communicate or deal with information. This should be taken into account in the shaping an Information Society adapted to the aspirations of the inhabitants of the region.

2.3.1 A relation between trust in public institutions and e-behaviour?

Using figures on trust towards public institutions could be one way to search for possible explanations for the modest position of Flanders concerning e-government.

As already mentioned in the first section of this report, the position of Belgium with regard to e-government does not look very positive. According to Table 2.6, regular and occasional contact with the government is with 4 and 12 percent below the EU-averages of 10 and 20 percent, in 2000. Moreover, Eurostat data shows that the percentage of municipalities which have a website for civilians in 2000, was 38% in Belgium , against 56% in the EU-15.

Table 2.6 Contact between civilians and government via internet, 2000

	Has there been contact between civilians and the government via Internet (website or e-mail)?			
	Regularly	**Occasionally**	**Seldom or never**	**Do not know/ no answer**
European Union	***10,3%***	***20,4%***	***59,8%***	***9,6%***
Belgium	**4,3%**	**12,2%**	**53,9%**	**29,5%**
Denmark	12,7%	19,0%	66,9%	1,4%
Germany	7,7%	10,1%	73,8%	8,3%
Greece	4,8%	41,9%	52,4%	0,8%
Spain	15,7%	42,8%	39,8%	1,7%
France	9,1%	24,1%	66,7%	0,0%
Ireland	4,0%	16,7%	55,0%	24,3%
Italy	14,7%	38,7%	40,7%	5,9%
Luxemburg	11,6%	21,1%	56,0%	11,3%
Netherlands	13,7%	24,6%	56,6%	5,1%
Austria	8,7%	21,3%	38,7%	31,4%
Portugal	13,2%	31,3%	38,1%	17,3%
Finland	11,7%	15,4%	59,1%	13,8%
Sweden	8,1%	15,6%	53,7%	22,6%
UK	10,3%	15,3%	62,4%	12,1%

Source: Eurobarometer 2000

For Flanders similar comparative data are not available, but Table 2.7 shows very recent data on the same issue. The percentages of regular and occasional contacts with government institutions via Internet is closer to the EU-15 average in 2000, in Table 2.6 above. Striking though is the high percentage of people who have had (regular or occasional) such contacts in the past but do not have them any more.

Table 2.7 Contact between civilians and government via Internet, Flanders, 2001

	Regularly	Occasionally	In the past, not any more	Never
Flanders	11.8	17,2	22,3	48,7

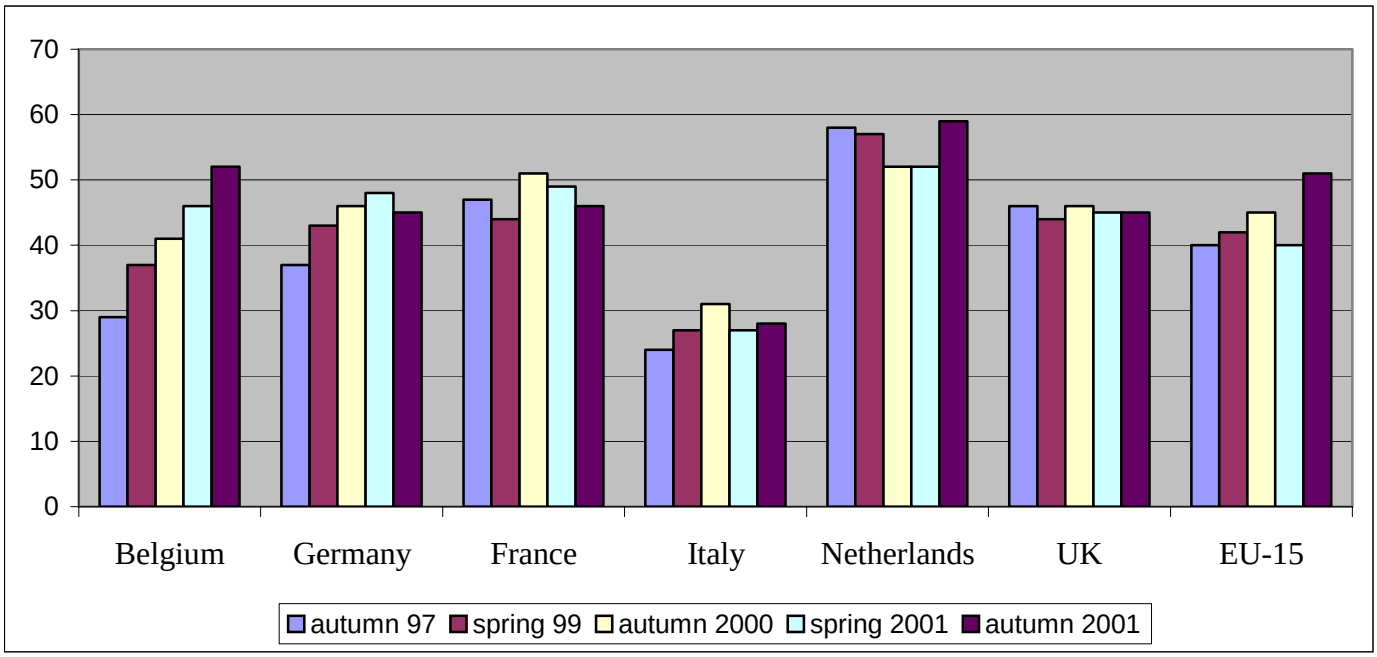
Internet Statistiek Vlaanderen 2001

One item to look at to explain this situation would be that of trust in government institutions. The hypothesis would be that it could perhaps partly explain this. The item of trust in public

institutions in Belgium like the police, the law-system, federal and local administrations, is very much debated, especially since 1996, when Belgium was earthquaked by sordid child abuse affairs that were the start of intense citizens protests against the functioning of the public institutions as a whole. Van de Walle et al. (2003) provide an overview of several data sources dealing with the trust issue (Eurobarometer, European Value Studies and APS). Figure 2.3 shows indeed that in 1997 trust in government institutions was very low in an international perspective, but of course, given the circumstances, such data are probably heavily influenced by the particular climate in the country. Since then, it has increased though, and the latest figures show that the trust is in 2001 even slightly above the EU-average. The increase in trust in Flanders is also recorded by APS.

Based on the figures for Belgium in 1997, Bral (1999) showed that the trust in Flanders was even lower than in the rest of Belgium. The more recent data can not split between the regions of Belgium but can be split according to the language used in the survey. This shows that there are no differences between the Dutch and French speaking respondents.

Figure 2.3 Trust in public institutions in a number of EU countries



Source: Eurobarometer, several years

Figure 2.3 shows that the situation in Belgium is today comparable to the average situation in the EU, i.e. approximately 50% of the population has a problem of mistrust in institutions, which is certainly not favourable for the development of e-government applications.

One question in the Internet-survey for Flanders in 2001 showed that 82% of the people who had used Internet in the past 6 months, would be interested to make use of public service transactions via Internet, if they were available. The problem does not seem to be so much a lack of demand for e-government but rather a lack of supply.

Fear of security problems, and lags in the implementation of the electronic identity card (notably due to the complicated institutional structure) are also likely explanations for this lag.

Finally, the problems in modernising public administration, with notably the failure of the Copernic reform (a tentative broad reform of the public institutions management), are also

important barriers for e-government development. It can even be argued that, without efficient public services in the traditional economy, it is almost impossible to go for e-government.

2.3.2 Behavioural Economics

Behavioural aspects concerning risk-taking, attitude towards innovation, and entrepreneurship should be among explanations for development of the more economic part of the Information Society in Flanders. The availability of reliable and internationally comparable data on this respect is scarce though.

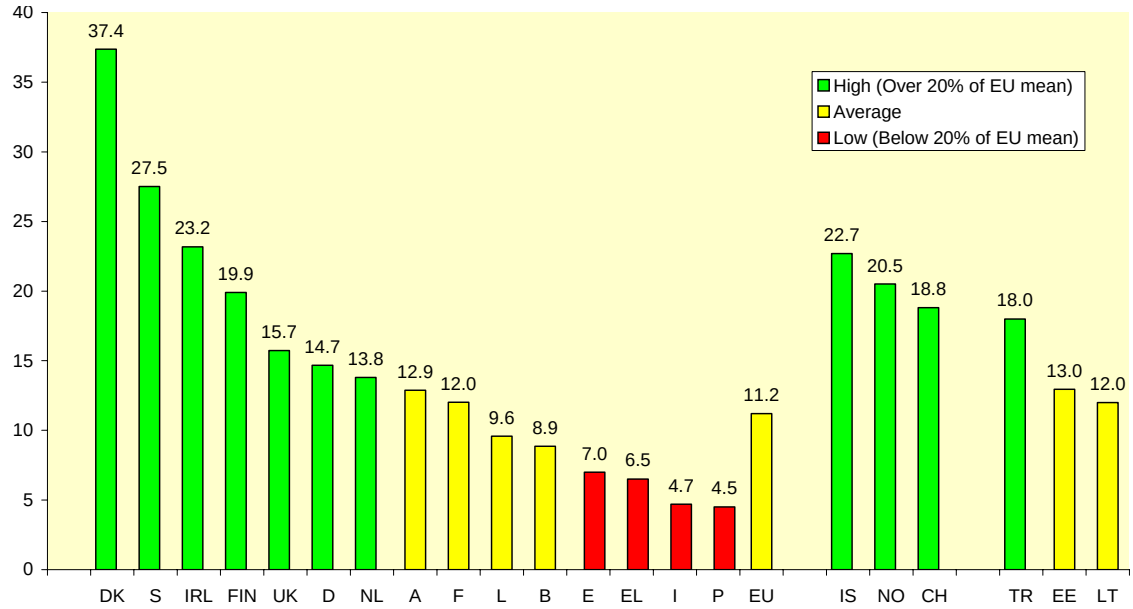
According to the 2001 European Innovation Scoreboard (European Commission, 2001), Belgium ranks at the mid-lower end of the spectrum of innovative performance of EU economies. The "summary **innovation** index" for Belgium is below average; and one major relative weakness of Belgium within Europe lies with the innovative capacity of its SMEs. Table 2.8 shows that, for the three indicators capturing innovative behaviour of companies, all extracted from the Community Innovation Survey (CIS) results, Belgium is consistently scoring poorly, below EU average. Experts' views from Agoria-ICT (the industry association of ICT companies) are that SMEs in Flanders have not yet taken up fully the networking and co-operation spirit, which seems so important in developing towards a knowledge-based network economy. This is only an opinion, but Figure 2.4 shows this could be true.

Table 2.8 European Innovation Scoreboard 2001: countries scores on innovativeness

Country	SMEs innovating in-house (% of manufacturing SMEs – rank of country)	Manufacturing SMEs involved in innovation co-operation (% of manufacturing SMEs – rank of country)	Innovation expenditures as % of all manufacturing turnover – rank of country
Ireland	62.2 % - 1	23.2 % - 3	3.3 % - 8
Austria	59.1 % - 2	12.9 % - 8	3.5 % - 7
Denmark	59.0 % - 3	37.4 % - 1	4.8 % - 2
Germany	58.7 % - 4	14.7 % - 6	3.9 % - 4
The Netherlands	51 % - 5	13.8 % - 7	3.8 % - 6
Sweden	44.8 % - 6	27.5 % - 2	7.0 % - 1
Italy	44.4 %-7	4.7 % - 14	2.6 % - 11
EU mean	*44.0*	*11.2 %*	*3.7 %*
France	36.0 - 8	12.0 % - 9	3.9 % - 5
United Kingdom	35.8 - 9	15.7 % - 5	3.2 % - 10
Belgium	**29.4 - 10**	**8.9 % - 11**	**2.1 % - 13**
Finland	27.4 - 11	19.9 % - 4	4.3 % - 3
Luxembourg	24.5 - 12	9.6 % - 10	n.a.
Portugal	21.8 - 13	4.5 % - 15	1.7 % - 14
Spain	21.6 - 14	7.0 % - 12	2.4 % - 12
Greece	20.1 - 15	6.5 % - 13	1.6 % - 15

Source: European Innovation Scoreboard 2001.

Figure 2.4 SME's involved in co-operation in innovation (% of manufacturing SME's)



Source: CIS II

However, the reliability of the CIS data are heavily criticised by the actors in charge of their collection. The drop of 50% in the rate of overall innovation in Belgium from one enquiry (CIS 1) over the other (CIS 2), is one example of the fragility of those indicators. Therefore, the "innovation deficiency" thesis can only be proposed here as a hypothesis, to be tested further.

Flemish SMEs suffer from a number of weaknesses linked to their small size, that are however not specific to this region. As evidenced in the analysis carried out recently by (KPMG, 2001) for the Flemish government, SMEs in the region **lack a strategic vision** on the potential benefits of ICT use. The weak awareness about ICT usage is presented as a main limiting factor for the generalisation of "intelligent" use of ICTs by those companies. When such technologies are adopted, it is rarely on the basis of a sound analysis of real needs. The secretive character of SMEs management, the unwillingness to diffuse information outside the company, and the resistance to organisational changes, are among the factors that lie behind the lag experienced by Flemish SMEs in entering the Information Society. And, as already mentioned above, a vicious circle seems at work, in which, because of lack of demand, the formation of an adequate offer for ICT services to SMEs is lagging behind, and because of this lack of appropriate support, SMEs are reluctant to outsource or simply seek advice for their ICT developments.

Another unfavourable factor could be the **entrepreneurial attitude** in Flanders. The scarce data provides a mixed picture, though. The recent General Entrepreneurship Monitor (GEM) study (Manigart et al. 2000) provided data that could indicate that Flemish people are less entrepreneurial than others: this region lies consistently in the bottom league of a panel of 21 countries, even when considering various alternative measures of entrepreneurship activity (Table 2.9).

Table 2.9 Entrepreneurial measures in 21 GEM countries

Country	Total entrepreneurial activity	Start-up activity	New business prevalence rate
Brazil	16.0	12.3	4.4
Korea (South)	13.7	5.3	9.0
USA	12.7	9.8	4.7
Australia	10.9	8.1	3.3
Canada	7.9	6.2	2.2
Norway	7.9	5.5	3.5
Argentina	7.8	6.1	2.1
India	6.3	3.5	2.9
Italy	5.7	3.4	2.6
UK	5.2	3.1	2.2
Germany	4.7	3.8	1.4
Denmark	4.5	3.0	2.1
Spain	4.5	3.2	1.4
Israel	4.2	2.6	1.7
Finland	3.9	1.9	2.5
Sweden	3.9	1.9	2.2
Belgium	*2.4*	*1.4*	*1.1*
France	2.2	1.2	1.0
Singapore	2.1	1.5	0.8
Flanders	**1.4**	**0.8**	**0.7**
Japan	1.3	0.9	0.4
Ireland	1.2	1.0	0.3

Source: GEM (2000).

Other sources and figures seem however to contradict the GEM-study. For example, Flanders has a high percentage of 'self-employed': 'firms' without employees. Also a recent study in Flanders showed that a considerable share of graduated students is interested to start a firm. And finally, one could wonder if the GEM indicators really reflect attitudes, or if they are not rather an indication of an unfavourable regulatory (too much red tape) and fiscal environment, which, according to firms and firms representative, are the key explanatory factors for the low rate of firms creation. Another regulatory factor was found to be highly, and negatively correlated to the rate of entrepreneurship, in the GEM study: the level of social protection, that would discourage would-be entrepreneurs that elsewhere emerge by necessity. With one of the most generous social security system in Europe, Belgium is thus likely to be rated very low in this type of survey.

Apart for the exceptional developments of the electronic banking systems, Flanders lacks **flagship models** linked to ICT production or use (there is no Nokia in the region…). Potentially powerful demonstration effects, particularly interesting to convince "standard" SMEs of the benefits to adopt ICTs, are thus scarce. Even more so, a very negative message was received by the population, with the failure of the Lernhout&Hauspie Flemish "success story" (see above). After the occurrence of this Flemish "Enron"-like case, confidence in ICT-related developments and provision of Venture Capital could have been eroded in the population. However, after the dot com crash in 2000, it could be argued that the L&H story may not be seen as such a particular story, but as a symptom of a more wide-spread phenomenon.

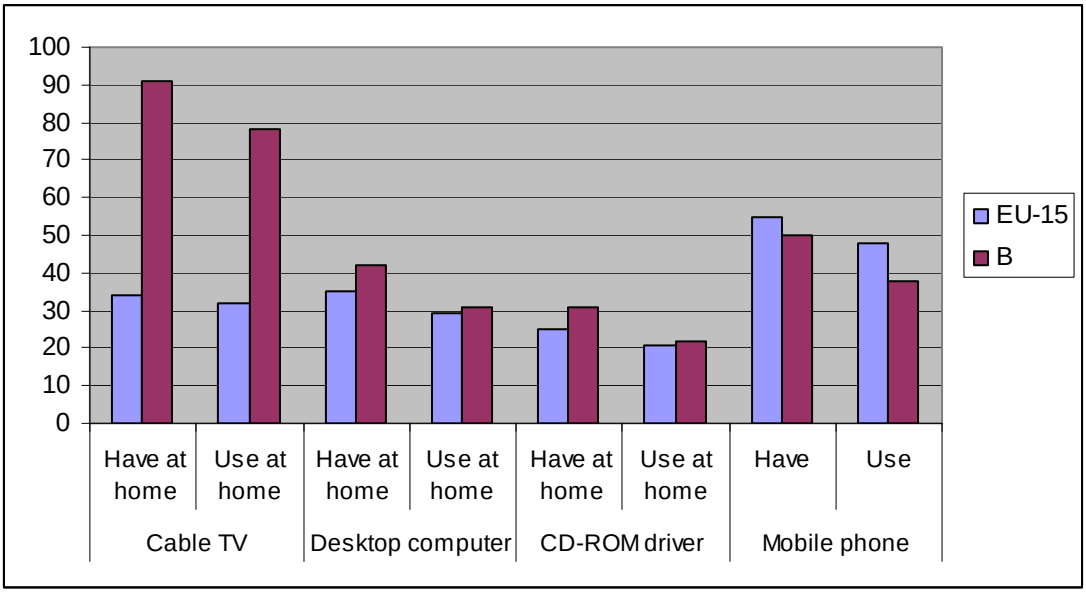
Another possible explanation of the relatively low use of ICT by citizens, could be the relatively recent, and possibly ill-adapted, **IT education at school**. Even if today the rate of PCs and Internet connections at schools is high in Flanders (see section 1), this is probably too recent to account for a significant influence on citizens' familiarity with ICT. And some

argue that even today, too few teachers have a sufficient competence in ICT-use, to be able to take full advantage of their opportunities in the framework of education. Thus, late introduction and lack of competences for ICT in education might act against a wider use of ICT in the population at large. As mentioned in the first section of this report, the good scores of the country in international statistics of education might hide qualitative deficiencies when it comes to deal with the Information Society. The GEM study cited above explains the low rate of entrepreneurial activity notably by an "*educational system where creativity, innovation and risk-taking are not highly valued*", notwithstanding the overall quality of the education system. Similarly, observers of the Belgian labour market have recently stated as a conclusion of a debate that "*the main challenge for our universities and high schools, is to learn evaluate creativity, rather than the capacity to repeat lessons like parrots"* (Eddy Daniels in Imediair, 24.10.2001). This is again a tentative hypothesis, proposed for further exploration.

2.3.3 Cultural explanations for e-behaviour?

As stated before, the level of expenditures on ICT-equipment in Flemish firms and in Flemish households can not explain the low usage of ICT's. But Figure 2.5 shows very well that especially in Flanders there is a difference between ownership and use of ICT-equipment in Belgium: households are well equipped but the rate of use is quite lower. This picture is general throughout Europe, however.

Figure 2.5 Ownership and use of ICT-equipment in Belgium and EU, percentages 2000



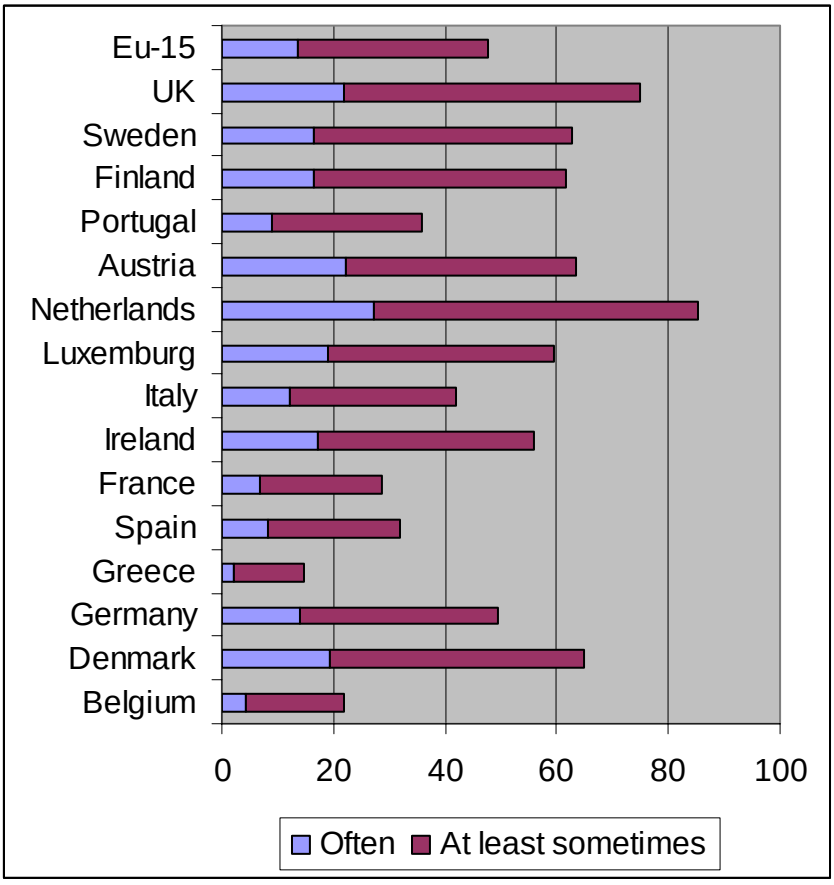
Although Table 2.10 is based on data from a few years ago, the interest expressed in many applications of multimedia use is very low in Flanders compared to the interest in the European countries. Most of the more recent studies measure the actual use, but "not being interested" in the various applications seems an important explanation.

Table 2.10 Interest in multimedia-use for Flanders and 11 EU-countries, 1998

Multi-media applications:	Flanders %	Average 12 EU-countries %	Rank Flanders (among 12)
Watch museum collection	9,3	21,6	12
Political debate/contact	6,6	12,3	12
Courses	26,8	38,1	11
Doctors advice	37,2	43,0	11
Administration, local government etc.	46,5	50,3	8
Prepare travel	38,1	45,9	9
Read news etc.	24,2	32,4	11
Info on products	30,3	37,2	11
Job-search	31,7	43,1	12
Info on consumer rights	24,0	36,4	12
Banking information	29,4	37,7	10
Insurance etc.	11,0	14,4	11

Source: Eurobarometer, November-December 1998, computations Administratie Planning en Statistiek

Figure 2.6 Use of internet as information source for purchases, in %, 2002



Source: Gallup Europe, Flash European Barometer 117, January 2002

Looking at which information sources consumers use to prepare purchases, a difference can be noticed between Belgium and other countries in their information source preferences. In a study conducted for Eurobarometer survey, the question was: "Personally, as a consumer, which information sources do you normally consult to prepare your purchases? Often, sometimes or never". Most respondents did not use any of the sources mentioned. The highest scores for 'often consulted' are 'advertising leaflets, Brochures from manufacturers and consumer publications'. Figure 2.6 shows the percentages for using Internet, often and 'at least sometimes'. The use of Internet as a source in Belgium is far below the one that holds for most countries, showing the unfamiliarity of consumers with this new tool.

International comparisons of the preference for other activities concerning information and communication (Table 2.11) shows that, in Belgium, there is a slightly lower than average participation for in-door leisure activities like watching television, reading magazines or newspapers or books, and a higher participation percentage for outdoor activities like going to a café/pub or to Cinema/theatre/concert (see also Table 2.12).

Table 2.11 Participation percentages for some leisure activities*, in 11 European countries, 1992

	Watching television	Reading magazine or newspaper	Reading books	Meeting friends	Going to café/pub	Going to Cinema, theatre, concert
Belgium	**91**	**62**	**31**	**45**	**18**	**6**
Netherlands	90	87	50	58	10	4
Germany	94	90	30	42	10	4
France	94	82	44	63	4	6
Ireland	93	91	41	75	31	3
UK	94	85	54	68	22	4
Denmark	94	91	45	55	11	5
Greece	90	45	12	69	7	3
Italy	94	53	21	48	15	5
Portugal	82	32	10	34	21	2
Spain	92	40	14	57	17	2
Average for all countries	***92***	***69***	***32***	***55***	***15***	***4***

*Source: Eurobarometer; * Percentage of people saying that they undertook the activity in the previous week.*

This pattern of preference could contribute to an explanation why people in Flanders do not use ICT-equipment that much, compared to for instance people in Nordic countries. Besides a preference this could also be related to the opportunities for out-door activities. For Flanders the very high density in terms of population and leisure facilities (e.g. restaurants and pubs, see table 2.13) adds up to this explanation.

Table 2.12 Cultural participation, percentage of people between 15-75 that visited a concert, museum, theatre in the past 12 months, 9 European countries in the 1990s

	Classical concert	Pop concert	Museum Attendance	Theatre performance
Flanders (1998)	**31**	**27**	**48**	**49**
Netherlands (1995)	16	25	31	27
France (1997)	9	16	32	15
UK (1991)	13	18	32	39
Denmark (1993)	16	.	55	26
Finland (1991)	11	12	43	38
Italy (1995)	10	19	29	18
Spain (19900	7	10	28	14
Average all countries	***14***	***18***	***37***	***28***

Source: Sociaal and cultureel Rapport 2000, Sociaal en Cultureel Planbureau Nederland

Table 2.13 Density of facilities in the catering industry: restaurants and cafes/pubs in 11 European countries, 1997

	Restaurants		Cafés/pubs	
	per million inhabitants	per 1,000 sq. km.	per million inhabitants	per 1,000 sq. km.
Belgium	**2.079**	**690**	**2.934**	**975**
Netherlands	1.239	470	1.253	457
Germany	1.332	305	847	194
France	1.400	147	847	89
Ireland	724	37	2.449	124
UK	1.722	410	1.377	328
Denmark	1.507	183	468	57
Finland	744	11	1.350	20
Italy	1.573	299	2.622	498
Spain	1.486	116	5.400	423
Average	***1.381***	***267***	***1.955***	***324***

Source: Hotrec (www.hotrec.org)

A stronger evidence to support the claim that many people in Flanders would have a preference for the 'real' world, rather than a virtual one, is provided in Table 2.14. Compared to other countries, much more people in Flanders visit a museum, but only 9.3 % of the people in Flanders were interested to use multimedia to watch museum collections on a screen, whereas the average of 21.6 percent of the people in the EU is interested in such 'virtual' museum visits. Of course, lack of interest could simply be a reflection of lack of opportunities and knowledge about this, rather than a real attitudinal disposition.

Table 2.14 Interest in real and virtual museum visits in international perspective

	% of people having visited a museum in past 12 months	% of people interested to use multimedia to watch museum collection (1998)
Flanders (2000)	61	9.3
Netherlands (1999)	33	
Italy (2000)	31	
Greece (1998-1999)	42	
Finland (1999-2000)	29	
Sweden (2000)	46	
EU-15		21.6

Source: APS, 2001; Sociaal en Cultureel Planbureau Nederland, 2000

Conclusion

The general profile of Flanders is very positive. It is a wealthy, centrally-located and well-developed region, as shown by economic and human development indicators. The Flemish population is well educated and households dispose of comfortable revenue. A lot of autonomy has been conferred to the Region, which invests in pro-active development strategies. The profile of Flanders as an Information Society is however unbalanced. Overall, the region seems well placed on the European scene, but we have identified a number of weak and strong points:

- Flanders is strong in ICT infrastructure developments, with notably a leading position in broadband infrastructure and the presence of a regional alternative telecom operator, as well as other aspects, e.g. PC equipment in schools (although the latter is fairly recent);
- Flanders hosts a relatively important ICT sector, as well as relatively high level of R&D in ICT, with IMEC as an important centre of excellence, and interesting spin-offs dynamics in some places;
- These strong positions are not matched with similar rates of ICT-use, notably the use of Internet by households and small companies. Flanders is even at the bottom of the European league concerning the rate of consumers buying on-line;
- Also the development of an e-government, is comparatively less well developed, although a recent policy-push at the regional level seems very promising.

A paradox appears thus, between the favourable context for the development of Flanders as an Information Society, and actual achievements: **potential** for the IST developments in Flanders is stronger than effective and diffused **usage** in the wider population. However, interest in IST-related developments is only justified by the fact that these could bring benefits to citizens, in the form of more productivity, new opportunities, more efficiency, more well being. Thus, the identified weaknesses in uptake and usage, especially for households and SME's, may hamper the level of expected **impact** on the Flemish society, including its economy.

The strong aspects of Flanders could in the traditional linear conceptions be labelled as "input" factors. Obviously, these do not give automatic rise to the additional desired "outputs". Something must go 'wrong' in the system, or to put it in the terms of the FISTE[20] framework, there must be bottlenecks and we have looked beyond a mere technologically and economic determined explanation to find the reasons for this. The present study proposes three "principal dimensions' or "driving forces" across the myriad of elements that influence the evolution towards the Flemish Digital Society:

1. **The "Flemish identity" push: a politico-institutional explanation**. This driving force is linked with the particular situation of Flanders, a region that is pursuing a long-term strategy of autonomy. The process of federalisation of Belgium was at initial time hampering the development of a strong national vision and policy plans of the IS. But then, supported by a strong political will to build on the Flemish identity to

[20] FISTE: Foresight in Information Technologies in Europe, a methodology developed by IPTS in 2002, to balance the identification of supply-side IST trends with demand – side impact analyses.

differentiate from the rest of the country and reach success based on its own forces, the region focused on high-tech development as a way to reach this ambition. Policy awareness and numerous pro-active programs have been developed (with as flagships IMEC and Telenet), but the linear vision on which they were originally founded induced a strong focus on infrastructures and on the "hardware" of the Information Society, rather than a preoccupation for the "software" aspects – mainly the absorptive capacities for such technological developments in the wider public. Progressively, the minds are changing and recent initiatives show a growing attention to users' needs and the recognition of the importance of availability of appropriate applications that could widen the effective usage of ICTs and contribute to regional development in a larger sense. The achievement of a really "holistic" innovation is still a challenge however, as it implies a change in traditional policy and administrative practices.

2. **The telecom market and infrastructure**. A comparative advantage of the region is the availability of a dense cable TV network over the whole territory. Through the creation of Telenet, Flanders made the plan to introduce competition in the quasi-monopolistic telecom market, and exploit new technological opportunities. On the technical side, it is already a success, on the economic and societal aspects, much remains still to be proved. Today, the proportion of broadband users is remarkable in Flanders, but the lack of cheap access to "Internet for beginners" might still be a problem, notably for the poorest and least-aware segments of the population. Even rich populations have their less wealthy citizens, and the digital divide is present in Flanders. A new regional strategy is currently implemented to address this issue, with the development of interactive TV. New challenges may also appear soon, if satellite or mobile technologies introduce more competition.
3. **Behavioural and cultural aspects and Information Society**. The latter driving force concentrates on the cultural explanations for the relative lag in IS progress and for the digital exclusion of a (still too large) number of Flemish SMEs and citizens. One question here is how far the "model" of Information Society proposed is well adapted to the particular habits, preferences and characteristics of the population. The challenge could be to develop a more "Latin" model of Information Society, with room for the important "real" activities, attention to tangible benefits and profits, combination with social aspects, and the integration of various modes of access and use of information. Another issue is the need, as a pre-requisite for successful exploitation of IST-related opportunities, to foster entrepreneurial spirit and innovative behaviour in companies, and create more links between the advanced companies and the more traditional ones. Finally, the education challenge is critical, as IST-developments challenge traditional modes of teaching and learning.

Reminding the FISTE framework, the main conclusion from these three critical factors above is that **the bottleneck in Flanders was on the 'demand-side IST-developments'**. From a strength and policy focus on the supply side developments, Flanders has been catching up by addressing demand-side developments at the regional level with a set of initiatives. The balance between the supply-side developments and the demand-side developments improved and already gave rise to a catching up on several IST-related issues.

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Annex 1 Interviews

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